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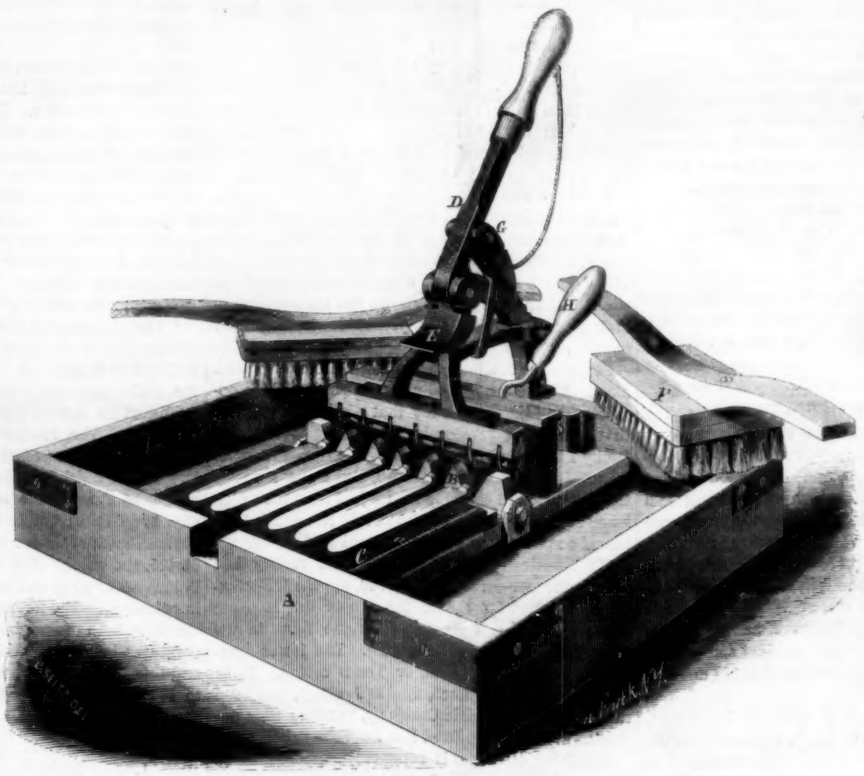
Improved Knife Cleaner.

This knife cleaner is intended for hotels, steamboats. boarding-houses, saloons, or large private families, where many knives have to be cleaned in a short time. It is now in use in most of the city hotels and large restaurants, and is certified by the proprietors of them to be a very excellent machine. It cleans from six to a dozen knives at once, according to size of machine, in a very superior manner. The machine consists of a box, A, for holding the knife frame, polishing powder, and brushes. The knife handles are placed in stocks, B, and have their blades resting on a cushion, C. The lever, D, is then brought forward, and by means of the cam-shaped toe, E, it holds the handles firmly while the blades are being polished. This latter is effected by the brushes, F, seen at the side. One of them is for applying moist polishing materials, if necessary, and the other for giving the final luster. The pawl, G, catches in the rack, H, and holds the lever up so that the knives cannot slip while being operated on.

When one side of the blades has been thoroughly cleaned, a movement of the handle, H, reverses them, so that the other side is in position to be cleaned.

This machine is durable and strongly made, and large numbers of them are now in use. It was patented on the 27th of January, 1863, by Geo. Weedon, of this city. For further information address him at 383 Sixth avenue, New York.



WEEDON'S KNIFE CLEANER.

The Corn-sugar Patent.

In the list of patents issued during the week ending Dec. 20, 1864, is one to F. W. Goessling, of Buffalo, N. Y., the claim of which is in these words, "I claim a new and improved compound sugar made by a combination of cane sugar or cane sirup with corn sirup, substantially as set forth."

It has been claimed for Mr. Goessling that he had discovered the art of converting grape sugar into cane sugar. This would have been a great discovery. But if his invention is no more than the above claim—the sweetening of grape-sugar sirup with ordinary sugar—we are unable to perceive its great magnitude. Perhaps more important discoveries are yet to be made. We shall watch with interest for further developments in this new sugar enterprise, which, in importance, if half be realized that is claimed for it, is hardly equalled by the Petroleum interest.

Long Bearings and Large Valves.

The engines for the new fast frigates building by Government are of unprecedented dimensions for machinery of their design. The cylinders are two in number, horizontal, 100 inches diameter, and 4 feet stroke.

The bearings of these engines are unusually long, being in diameter 18 inches, and in length 4 feet. The engines have slide valves of immense weight and area; deprived of the steam pressure alone the mere stopping and starting of these valves thirty or forty times in a minute is an enormous waste of power. The valves have steel rollers under their bottom edges, and under the steam face, to relieve the excessive friction. A pair of car wheels ten or twelve feet in diameter would materially aid in reducing the friction but rollers under the faces would seem difficult to regulate so as to be beneficial.

Petroleum Stock Swindle.

Since our recent expose of the oil stock swindle the ardor for investment in that direction appears to have cooled off to a considerable extent. The people are beginning to realize that the windy prospectuses of Petroleum Companies are nothing more than cunningly contrived traps in which to catch the unthinking multitude. A journal published in this city, representing the petroleum interests gives a list of several Companies as being entirely worthless whose aggregate capital amounts to six million dollars.

The dupes who have fallen into these traps ought to have the schemers indicted by the Grand Jury for swindling.

The Erie (Pa.) *Dispatch* sharply denounces the bogus oil Companies and oil speculation in that section. It claims that correspondents writing to some New York papers furnished lying reports of oil discoveries, and modestly claim to be the only reliable exponent of the business interests of the oil country of north-western Pennsylvania.

Cotton Cultivation in the West Indies.

Hunt's Merchant's Magazine says :—

"A company has recently been formed in this city styled "The American and British West India Cotton Co.," which has leased for a term of years 2,000 acres of land, on Long Island, one of the group of Bahamas, situated in latitude 23° 10', longitude 75° 3'. This island, it will be remembered, is 100 miles long, from 5 to 7 miles wide, and from 50 to 75 feet above the level of the sea, and no climate in the world is more healthy or better adapted for invalids. The average temperature is 80°, never rising above 85°, while the land is said to abound in springs of the best kind of water, which is obtained by digging from five to fifteen feet. Previous to the year 1835, it was settled by cotton-planters with their slaves, and thousands of bales of Sea Island cotton were annually exported to Europe. When slavery was abolished, the culture of cotton ceased, and almost the whole of the white population emigrated to other countries, leaving the land to the freed blacks, who employed their time in making salt.

During the past two years, several persons have had a portion of the land cleared, and have raised a small quantity of cotton, the quality of which is claimed to be superior to any raised on the coasts of Georgia and South Carolina, selling here at higher prices than the best Sea Island cotton raised in this country. Estimates of the cost of raising place it at ten cents (gold) per pound, and an acre with good cultivation will yield four hundred pounds.

This company has been formed for the purpose of cultivating this land, and, to relieve themselves from the difficulty of procuring laborers, have sent a number of men from the United States, who will always be in their service. The company feel sanguine that, with careful management, the original cost will be below the above estimates; and should peace once more reign in our country, and everything be reduced to its former standard, the prospects of the company will be no less favorable, as the quality of cotton raised on the island always sold at sixty cents per pound.

ENGLISH BALANCE OF TRADE.—*Blackwood's Magazine* says that last year the exports from Great Britain amounted to 160 millions sterling, and the imports to 280 millions. Every nation must have what is called a balance of trade against it every year.

Hall's Journal of Health, a monthly periodical, containing useful information on various subjects, is published at No. 12 Union Square, New York, for $1 50 per year.

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The Association held its regular weekly meeting at its room at the Cooper Institute, on Thursday evening Jan. 5, 1865, the President, S. D. Tillman, Esq. in the chair.

The President remarked that as it was the beginning of the year he would read, in place of the usual summary of scientific news, some statistics of the annual trade and industry of the country. A statement that our exports exceeded our imports led to a brief discussion on—

THE BALANCE OF TRADE AND THE CUSTOM HOUSE BOOKS.

Mr. Adriance explained that at our custom houses the imports are entered at their cost in specie, and the exports at their cost in paper. Reducing the exports to their specie value there would be a balance of trade against us to the amount of $80,000,000.

Mr. T. Smull remarked that this was a good thing, it shows that our commerce is profitable to the country. If our imports were not of more value in our markets than the exports, our merchants would not merely be doing business for nothing, but they would also be losing the freight, insurance, port charges and all of the other enormous expenses of transporting merchandise over the ocean. The balance of trade against a nation, as shown by custom house books, is simply an expression of the cost and profits of commerce. Trade is mutually beneficial, and every nation has a balance of trade against it every year.

A SPECIMEN OF MICROSCOPIC ENGRAVING.

The President exhibited an engraving of the Declaration of Independence, of precisely the size of a silver dime. It was engraved on steel by hand for the Bank Note Company. It had the signatures of the drafting committee only, and these, being larger letters than the body, could be read by the aid of a good eye-glass; but a microscope was required to read the remainder

The President next called on Mr. Watson to open the regular subject of the evening—

THE MANUFACTURE OF THREAD.

Mr. Watson:—Mr. President—To the people of this country at large, the importance of a good sewing thread is very great. Until a few years, almost from the commencement of the war, English thread controlled the market, but within the time spoken of a vast trade has sprung up, involving tens of thousands of dollars of capital and giving support to hundreds of persons. There are, at this time, in this country, many thread manufacturers, and the aggregate value of the manufactured product amounts to $4,000,000 annually. The number of yards made is incalculable.

The necessary qualities in a good sewing thread, are strength, smoothness of finish, regularity in size, rotundity, freedom from knots, and uniformity in the quality. All these are obtained in our best American threads. I have been at some pains to obtain the leading threads in the market, and I have brought here, for your inspection, the Willimantic thread; the Green & Daniels thread and the Stafford Bros. thread. In addition to these there are other threads made. Perry's Water-twist, Samoset, Shaker's, and Circassian, are well known brands.

I have here also an English thread of Coats, and another one whose name I shall not give; the latter I submit for your examination. [The speaker here handed around an English thread which was very inferior.] Coats English thread is justly celebrated, it has been in the market twenty-five years and is uniform in quality; I think, however, that our domestic thread is, in all respects, superior. In the matter of strength I will make a simple test. I have here a spool of Coats's six-cord cotton and one of the Willimantic Linen Company. They are both of the same number—twelve—and both are taken indiscriminately from a dealer's stock in a store. I have but little faith in public experiments, for like spoiled children, they seldom show to advantage, nevertheless I will tie both together at the same length and see which will break first. [The speaker here tried the experiment, which resulted in the breaking of the English thread.] This accords with private experiments to determine the same thing. I took weights and applied them to a suspended Coats thread. When it broke I took the same weights and applied them to an American thread, which not only sustained them, but twenty-five per cent additional weight, without breaking.

I have heard it asserted that a glazed thread will lose its strength after the size has been washed off. I tried an experiment to determine this also, and saw no difference whatever, although I think it is possible to wash any glazed or unfinished thread for sinister purposes, so that the fibers will be dissolved or torn apart, and the strength destroyed.

I have here an American thread made by Messrs. Green & Daniels, and one made by Stafford Brothers; that of Messrs. Green & Daniels is styled "ivory finish," that of Stafford Brothers "enameled thread." Both of these threads are first class goods. They are 200 yards spools, four-cord threads and warranted to be as represented. They are now widely used, and manufacturers have told me that they used American black glazed thread in making silk cloaks, it being cheaper and as durable for their purposes as silk thread itself. I am also informed that three-fourths of the thread now in use is American thread, and our manufacturers are putting up extensive works to enable them to supply the demand.

The Willimantic Linen Company have erected a mill in Connecticut over 400 feet long at a cost of $1,000,000, in which they will make a six-cord soft-finish cotton. Very little soft-finish cotton has heretofore been made in this country, for the reason that our makers have had from 75,000 to 80,000 dozen glazed thread ordered in advance of their ability to supply it, so they were unable to make other kinds.

There are many persons who dislike glazed thread, and the introduction of it was attended with difficulties. It was asserted that the cloth was cut by it, that it ran stiffly through the needle and was liable to kink. These defects are apparent where thread is glazed too much, and experience has shown our makers that a little or medium sizing is preferable to a greater amount.

For sewing machine use glazed thread is much liked. I have questioned many sewing-machine operators, and they assure me that what I have stated to this meeting previously, is correct. In my own family I have been in the habit of using the Willimantic Linen Company's thread, and I may here say that I was led to examine the subject from the excellence of that article. I therefore do not speak from casual acquaintance but from actual test.

Our American cottons, at least that variety last named, are four-cord. From No. 40, up, the Willimantic cotton, and I presume the others also, is made from Sea Island cotton, which is the finest in the world for that particular service. The lower numbers are long staple, Gulf, or Texas cotton. Some cotton from Pernambuco, South America, has been tried by the Willimantic Company, but they were unable to use it, and suffered loss from the experiment.

The sizing of thread is commonly supposed to be starch. It is not. What it really is, the manufacturers know best. That is one secret which I cannot disclose. I am able to inform you, however, that one firm used an article called salep procured from Turkey. I have never seen any salep, but am told that it is exceedingly hard and almost vitreous in its nature, and one of the most difficult substances to grind known to man. It will destroy a French burr mill stone, and is, if my informant did not tax his imagination too highly, a most remarkable article. In the place of this salep, five ingredients are used, but of the nature and proportions of them I am ignorant. A sized thread is more costly and troublesome to make than soft finish.

English manufacturers are now putting up a mill in New Jersey, which they intend to stock with English operatives, for the purpose of competing with American makers.

From what I have said it will be seen that American thread is, in all respects, equal to the imported. I am unable to see why it is not better; for my own use I prefer it to English. It is certainly cheaper, for the best American threads can be bought for $1·10 to $1·15 per dozen, where the foreign-made costs $1·50. If it be urged that the duty on the latter is great, I present for your consideration the war tax of our makers, which is, I am sure, quite as onerous.

If it be a fact that American thread enjoys a monopoly of 75 per cent of the trade, I hope the time is not far distant when it will absorb the remaining 25 per cent, and retain the home trade for home makers.

PROF. RANKINE ON THE DENSITY OF STEAM.

After the completion of Messrs. Fairbairn and Tate's experiments on the density of steam, a full account of which has been given in the SCIENTIFIC AMERICAN, a paper was read before the Royal Society of Edinburgh, by W. J. Macquorn Rankine, C. E., LL.D., F. R. SS., the object of which was to draw a comparison between the results of the mechanical theory of heat and the results of the experiments. For a copy of this paper we are indebted to the author. He deduces the general equation of thermo dynamics from the "hypothesis of molecular vortices," otherwise called "the centrifugal theory of elasticity," and shows that this equation gives results coinciding almost precisely with those of Fairbairn and Tate's experiments. The following extracts from the paper may interest a portion of our readers.

ABSOLUTE COLD AND ZERO OF GASEOUS TENSION.

"These symbols have the following meanings:—T, the absolute temperature of an elastic substance as measured from the *zero of gaseous tension*, a point which was then estimated to be at 274°·6 Cent. below that of melting ice, but which is now considered to be more nearly at 274° Cent., or 493°·2 Fah., below that temperature. K, a constant, expressing the hight on the thermometric scale of the temperature of total privation of heat above the zero of gaseous tension. This constant was then only known to be very small; according to later experiments it is either null or insensible. C, the absolute temperature of melting ice, measured from zero of gaseous tension (that is to say, according to the best existing data, C=274° Cent., or 493°·2 Fah.)"

DENSITY OF STEAM AT VARIOUS TEMPERATURES.

"The experiments of Messrs. Fairbairn and Tate on the density of steam are described in a paper which was read to the Royal Society of London, as the Bakerian lecture, on the 10th of May, 1860, and published in the 'Philosophical Transactions' for that year. The results of those experiments give what is called the 'relative volume' of steam; that is, the ratio which its volume bears to that of an equal weight of water at the temperature of greatest density, 39°·1 Fah.; but in the following table of comparison, each of those relative volumes is divided by 62·425, the weight of a cubic foot of water at 39°·1 in lbs., so as to give the volume of one lb. of steam in cubic feet. The numbers of the experiments are the same as in the original paper; those made at temperatures below 212° being numbered from 1 to 9, and those made at temperatures above 212° from 1′ to 14′.

No. of Experiment.	Temperature Fahrenheit.	Volume of 1 lb. of Steam in Cubic Feet. By Theory.	By Exper
1.	136·77	132·20	132·60
2.	155·33	85·10	85·44
3.	159·36	77·64	78·86
4.	170·92	60·16	59·62
5.	171·48	59.43	59·51
6.	174·92	55·18	55·07
7.	182·30	47·28	48·87
8.	188·30	41·81	42·03
9.	198·78	33·94	34.43
1′.	242·90	15·61	15·11
2′.	244·82	14·77	14·55
3′.	245·22	14·67	14·30
4′.	255·50	12·39	12·17
5′.	263·14	10·96	10·40
6′.	267·21	10·29	10·18
7′.	269·20	9·977	9·703
8′.	274·76	9·158	9·361
9′.	273·30	9.367	8·702
10′.	279·42	8·539	8·249
11′.	282·58	8·145	7·964
12′.	287·25	7·603	7·340
13′.	292·53	7·041	6·938
14′.	288·25	7·494	7·201

AT Carbondale, Ill., there are three cotton gins in operation, and all have been busy since the beginning of the season. Three hundred bales have been pressed there, and sent to market, all from the vicinity. Other gins are at work in the county.

IMPROVED METHOD OF STAKING AND IMPROVMENT IN CURING HOPS.

At the last meeting of the Farmers' Club Mr. F. W. Collins, of Morris, Otsego County, New York, gave a very interesting description of the present mode of raising and curing hops, with an account of some important improvements which have recently been made in both processes. We present a summary of his remarks.

PLANTING AND CULTIVATING.

More hops are raised in Otsego county than in any other county in this state or country. The vines are planted in rows eight feet apart both ways. They are propagated by layers; a long vine is laid down, and in the course of the season it throws out roots from each joint, these are cut and planted in the hills. The first season the ground is also planted with corn or potatoes, no crop of hops being expected, though sometimes 200 lbs. are gathered from an acre. The second season each hill is staked with two poles, 20 or 25 feet high, no other crops are planted between the hops, and the ground is kept light and free from weeds by means of a horse cultivator. The second season about two thirds of a crop is obtained, and the third season a full crop.

PICKING.

The principal labor in raising hops is the picking, and this is usually done by women and children. The harvest season commences about the last week in August. The vines are cut off at the surface of the ground ; a strong man, by means of a properly prepared lever, heaves the pole from its hole in the earth, and carries it to a large box that will hold several bushels. Here the girls pick the hops from the vines, and put them into the box. The price paid for picking is from four to five cents per bushel, and a bushel will yield about two lbs. of dried hops. A smart girl will pick 30 bushels a day.

KILN DRYING.

The hops are taken from the field directly to the kilns where they are dried. The kilns are simply wooden buildings. A floor is prepared by laying slats about two inches wide, with spaces between them of the same width and covering them with a carpet of strong cloth, loosely woven so that the air may pass freely through it. The hops are piled on this cloth to the depth of from 12 to 20 inches, and they dry in the course of ten hours. It is found best to have the floor 10 feet or more above the stove and heating pipes below. As the hops immediately over the slats are protected from the drying action of the heat, it is necessary to stir them with a rake when they are partially dried. When the drying is completed the hops are pushed from off the end of the carpet, and drop a few feet upon the cooling floor ; when they are put into bags, and they are then ready for market.

IMPROVED MODE OF STAKING.

Within a few years a new plan of staking has been adopted, and it is working a revolution in the cultivation. In place of having poles 20 or 25 feet high, we set them only eight feet, and connect their tops in both directions by strings of strong twine, along which the vines are trained. The most important effect of this plan is avoiding the necessity of cutting off the vine at the time of picking. When vines are cut so early they bleed profusely, and this bleeding seriously injures and sometimes destroys the root. With the low stakes the strings are loosened at the top, when the vines slide down within the reach of the pickers. The top of the vine dies in the course of the winter, but the root escapes the great damage from bleeding. This increases the crop the next season. By the long pole system a crop was obtained ranging from 700 to 1200 lbs. per acre, but by the new system it is not uncommon to get 1500, and even 2000 lbs. to the acre.

IMPROVED PLAN FOR DRYING.

The value of hops depends upon the proportion of lupulin which they contain. The more they are stirred in the process of drying, the more of this fine dust is shaken out and lost. We now prepare a drying floor by stretching a series of No. 10 wires across the room, and spreading the carpet smoothly upon them. The wires do not intercept the heat, and the hops require no stirring. The carpet is secured to a roller at the delivering end, and when the drying is completed, the roller is slowly turned so as to wind up the carpet upon it, thus drawing the hops quietly along without shaking them in the least. By this plan we get hops of very superior quality.

SIX ACRES OF HOPS DESTROYED BY LIGHTNING.

Solon Robinson inquired if a plan was not patented for substituting wire for poles in training hops. Mr. Collins replied, "Yes, the plan of Mr. Aylesworth. He set large beams, like telegraph posts at the sides of the field and stretched wires across. Pieces of twine were then led down from the wires vertically to the hills. The plan was introduced in a number of fields. It had some advantages and some disadvantages. One difficulty was the liability of electricity to run along the wires. I knew of one field of six acres which was struck by a flash of lightning, and it went over the whole field, completely killing the tops of all the vines."

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

Improved Pocket-book.—This invention consists in the application of one or more strips of spring steel to the closing flap of a pocket-book, said strip or strips being secured in the edge or edges of the flap, in such a manner that by its action the pocket-book is kept closed without the aid of the usual clasps, strings, or other fastening, and if a portion of the pocket-book is unfolded or opened, the remaining pockets are still closed by the action of the spring flap, and their contents prevented from dropping out accidentally, and an article is produced of great convenience. It is capable of holding bills or papers of value of any description, and the danger of losing a portion of its contents is considerably lessened. J. Fred. Dubber, of the firm of Dubber & Martin, No. 160 William street, New York, is the inventor.

Adjustable Stake Holder for Railroad Cars.—This invention relates to a new and improved holder for secouring stakes to the sides of flat and sideless railroad freight cars. The object of the invention is to obtain a holder for the purpose specified which will admit of the stakes being adjusted or turned down in a horizontal position when required, so as to obviate the necessity of detaching or removing the stakes from the car at any time when an upright position of them is not required, as in loading and unloading a car, etc. By this means the stakes, not requiring to be detached from the car at any time, are not liable to be lost or mislaid, are always ready for use when required, and in case of breakage new ones may be readily applied. A. R. Burdick, of Racine, Wis., is the inventor.

Harness or Gig-saddle Tree.—This invention relates to an improvement in that class of harness or gig-saddle trees which are of iron and provided with wire jockeys. The object of the invention is to do away with nuts and all projections whatever, at the under side of the tree, which would have a tendency to injure or "gall," as it is technically termed, the horse's back, and at the same time have the bearings of the tree so formed or constructed that they will serve the double function of bearings and clamps and afford ample room for the back band and flaps, and admit of the saddle having a chaste and neat appearance. Samuel E. Tompkins, Newark, N. J., is the inventor.

Composition for Lining and Coating Articles of Wood, Stone, &c.—This invention relates to a composition, the principal object of which is to render petroleum barrels or packages perfectly tight, and prevent the loss by leakage, but which can also be used for lining or coating other vessels or articles. This composition is made of glue and other articles mixed therewith in such a manner that the same readily adheres to the wood and is not liable to scale or crack when the barrels are roughly handled, or exposed to the heat of the sun, or when the hoops are driven. It has been applied with perfect success to petroleum barrels so that they can be shipped to any part of the globe without the loss of a particle of their contents. The materials from which this composition is made are cheap, and can therefore be furnished at a small expense. Henry Preuss, 61 Cedar St., N. Y., is the inventor.

Apparatus for packing Tubes and Joints.—This invention consists, in general terms, in a novel method of packing the tubes of oil and other wells, or any other surfaces fixed or movable, by the use of a packing box whose body is made of flexible or elastic material which is made to act as a packing by means of the expansion of its walls. Samuel L. Fox, 924 Chestnut Street Phil., Penn., is the inventor.

Wire Fence.—This invention relates to a wire fence in which each section is constructed of one or two continuous pieces of wire extending over four sets of pulleys, two of which sets have their bearings on the end posts of the section and the other two sets on adjustable posts in the middle, in such a manner that by moving said adjustable posts towards or from each other the tension of the wire is decreased or increased and such tension will thus be readily accommodated to the existing temperature; and furthermore, by using a a continuous strand of wire the liability of the wire to break is materially reduced. The several strands of wires are supported and held parallel by brackets with oblique slots, cast or otherwise rigidly attached to posts which may be loose or fastened down to the ground; before the wires are strained, they can be easily introduced into the bracket, and by moving the movable posts an opportunity is obtained to force the wire apart when a person desires to pass through between them. The bearings of the pulleys are also cast solid with the posts so that the fence can be made cheap and durable. J, W. Norcross of Middletown, Conn., is the inventor.

New Mordant.

A new mordant, for aniline and other dyes, is said to have been discovered. It consists of acetate of aluminum and arsenitate of soda, and the discoverer, M. Shultz, believes that it is destined to replace albumen, gluten, tannin, and other matters employed for the same purpose. He mixes, at the ordinary temperature, four grammes of the aniline violet of commerce, in powder, with a quarter of liter of acetate of alumina, and twenty grammes of arsenitate of soda, thickening it with starch boiled in water—the quantity of starch to be diminished in proportion to the darkness of the color to be fixed. In the case of prints, it is recommended to mix the arsenitate of soda and the acetate of alumina with the coloring matter, and to steam the fabric or yarns over the mixture. For dyeing it is said to be better to treat the tissue, or yarns, in the first place, with a mixture of the two salts, and afterwards to dip them in the color vat in the ordinary way. Salts or compounds of tin, combined with alumina, may be used instead of arsenical acid.

Fast Firing.

At Shoeburyness, the Armstrong and Whitworth Committee fired 100 rounds rapid fire from the Armstrong 12-pounder breech-loader field gun. There was an interval of 10 minutes after the first 50 rounds. The time, as taken by the committee, was —for the first 50, 6 min. 58 sec., and for the second 50, 6 min. 35 sec.; 13 min. 33 sec., in all. Thus the gun was fired throughout the 100 rounds at the rate of 7½ rounds a minute; and for the second 50 rounds at the rate of 8 rounds a minute. *It was supposed on the ground that four shots were often in the air at the same time.* This is by far the most rapid artillery fire on record, and it is more than twice as rapid than ever has been accomplished by any muzzle-loading gun. No water was used, nor any sponging, nor did any hitch of any sort occur. At the 52nd round the lanyard that pulls the friction tubes broke; this caused a delay of 20 seconds.—*London Artizan.*

Edward Everett.

The Hon. Edward Everett, died of apoplexy at his residence in Boston, on the 15th inst. His age was about 71 years. A profound and universal feeling of sadness at the announcement of his demise pervaded all classes of our citizens. The nation loses in Edward Everett not merely a talented citizen, but one distinguished for patriotism, private virtues and liberal views on all that affects the welfare of man. Mr. Everett has been successively a preacher of the gospel, professor of a college, a member of Congress, a Governor of Massachusetts, Minister to England, President of Harvard University, Secretary of State and Senator from Massachusetts; each and all of these several positions he filled with credit to himself and constituents. It is expected that high national honors will be paid to his memory.

New System for Forging Cannon.

Mr. A. Hitchcock's process for forging guns is herewith illustrated and treated on by the inventor.

In all heavy forgings, as in the fabrication of large cannon and shafting, it is well understood by the practical man that no good forging can be done by a hammer that is too light to move the whole mass at every blow. If not, crystallization takes place just when this movement stops. But this theory is of minor consideration in heavy forgings. The prime difficulty being to unite a given quantity of wrought metal into a homogeneous mass. If a faggot be made up of many pieces, each piece must be heated to a certain degree before it can be welded, if no other element is introduced; but this is found impracticable even in shafting of eight inches diameter—to say nothing of forging a shaft or gun from two to five feet in diameter. Without going into details to show how large guns and shafting cannot be forged, I herewith give an illustration of a plan, whereby I can forge any number of tuns of iron or low steel (from one tun to one hundred tuns) into one homogeneous mass.

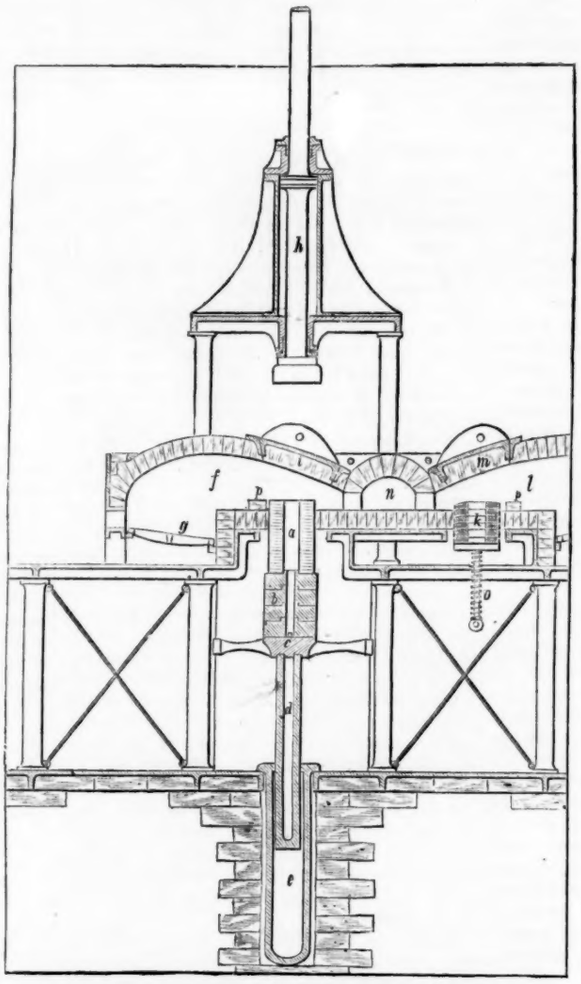
Mr. Alexander L. Holley, author of the latest book published in this country on "Ordnance and Armor," says on the subject:—

"To carry out, in the fabrication of large cannon, the principle of sound welding, Mr. Alonzo Hitchcock, of New York, proposes the system illustrated in Fig. 182. The iron is heated in a reverberatory furnace, to avoid its contact with sulphur and other impurities in coal. The gun is formed of rings of wrought iron or of low steel made without welds. The rings are so formed as to be united first in the center, that the superfluous cinder may be squeezed out. The anvil, *b*, is situated on the piston of a hydrostatic press, *e*, so as to be lowered as the successive rings, *a*, are added. The furnace, *f*, is situated between the anvil and the steam hammer, *h*, and so arranged that the rings project into it from below, and the hammer drops into it from above. The ring to form the muzzle of the gun is laid upon the movable anvil and projected sufficiently into the furnace to allow the flame to raise it to a welding heat. Meanwhile, in another part of the furnace the rings, *k*, are heated to welding in the same time by proportioning the heat, by means of dampers, to the relative bulks of the two parts. Without removing the parts from an atmosphere in which there is very little if any oxygen, they are laid together and instantly welded by a few strokes of the steam hammer. The anvil is then lowered by the thickness of another ring, and the same process is repeated. Although the gun may be of any size, the parts acually united at one operation may be made so light by reducing their thickness that the percussion of the hammer of moderate weight will be adequate. And when the whole operation of upsetting is confined to one joint, exactly the requisite pressure for that joint can be applied; and there is no fear of injuring other parts by setting it up soundly, because the mass of the gun below it is cold and forms a rigid pillar—practically a continuation of the anvil.

"It would appear that all conditions of sound welding may thus be attained if the process can be practically carried out. The objection raised by some iron-workers that the single iron will be burned before the larger mass is heated to welding, is not well founded. Certainly the heat in what are substantially, or may be actually, two different furnaces, can be regulated with the utmost nicety. Besides, the mass is already hot before the ring to be added is put into the flame. Locating an anvil upon water is simply a question of strength of what holds the water. A screw would answer the purpose and would not be liable to disarrangement, since an accurate fit is not important, and the adjustment does not take place at the instant of the blow. Or the screw might be employed simply to elevate and depress the anvil—the force of the blow being received by blocks of varying thickness placed between the anvil and its bed.

"The mechanical difficulties do not appear to be serious, and considerable cost of apparatus is warranted by the certainty of sound work. Mr. Hitchcock's process was intended especially for fabricating guns of low steel, the wings to be made without welds, by being originally cast in form of small thick rings, and then rolled, in a modification of the tin-rolling machine, to a larger diameter and a smaller section. This treatment would develop an endless grain in the rings in the direction of the circumference. Again, very short Armstrong coils could be welded together by Hitchcock's method, thus avoiding the embarrassment of Armstrong's present process."

All that has been said of guns in the above is equally applicable to shafting. For further information on this subject call on or address A. Hitchcock, Nos. 4 and 6 Pine street, New York.



HITCHCOCK'S SYSTEM FOR FORGING CANNON.

The Use of Apprenticeships.

M. Benoit-Duportail, a French engineer of eminence recently delivered the following opinions in relation to this matter, before the French Institute of Civil Engineers:—

"Apprenticeship is not special to manual trades, but common to all professions without exception. The young painter and sculptor, who pass several years in the studio of a renowned artist, are serving their apprenticeship. The case is the same with the young architect or engineer, who draw their plans and designs under the eye of another architect or engineer; with the young notary, who enters as seventh or eighth clerk into an office, to learn how to draw up marriage certificates, sale contracts, and inventories after decease; with the majority of merchants who serve their apprenticeship under the name of clerks in some shop or other; and it is the same in all conditions, in art, trade, and the professions in general. There is difference only in the nature of the work done. The means and progress are everywhere and always the same. The young men who follow a diplomatic career are themselves obliged to enter a ministry, prefecture, or the office of an ambassador to serve their apprenticeship. One must enter a study, a studio, an office, and a shop to learn those thousand details and secrets, the inner machinery of each speciality.

"It is in the establishments where is practiced the profession to be embraced, and there only, that professional teaching must be sought—one's apprenticeship passed. No school can replace the workshop, the shops, and the offices. Do not, then, let us seek to create with much trouble schools which would cost dear and be of no use. Let us develop the apprenticeship too much neglected during the last twenty years. Let it be recommended by men who have influence in industry, and we shall be sure of having clever and intelligent workmen, and good and beautiful produce which will rival foreign produce with success. What is in fact wanting is not a sufficient number of workmen to supply the needs of industry, but really clever workmen.

"In the interests of industry, and for the welfare of the apprentices themselves, in view of their future, it were highly advisable that patrons should admit no apprentice but with the warrant of a detailed apprenticeship contract, clearly stipulating the obligations and reciprocal engagements of either party. In these conditions the work-rooms would become what they should be—veritable schools, where the apprentice would receive the professional training necessary to him."

M. Benoit-Duportail considers the proportion which ought to exist between the number of workmen and apprentices. He remarks that the mean duration of a serious apprenticeship being from three to four years, and the period of practicing a profession being generally thirty-five or forty, the proportion should be about ten in one hundred, if there were no modifying causes. But as he finds in all work-rooms a considerable number of drudges, and as some employments—such as those of digger and smith—need no apprenticeship, he changes the relative number to five or six per cent. The proportion might with advantage be larger in the work-rooms commanding the best resources, richest in the means of instruction and practice, and most favorable to the development of young intelligence.

New Rock Salt Mine.—It is reported that in the new State of Nevada, beneath a thin covering of refuse saline matter, for a depth of fourteen feet, pure rock salt is found as clear as ice, and "as white as the driven snow." Beneath there is water, which seems to be filtered through it to an unknown depth. The whole of the fourteen feet in thickness does not contain a single streak of any deleterious matter or rubbish, and is ready for quarrying and sending to market. The locality is one hundred miles west of Roese river.

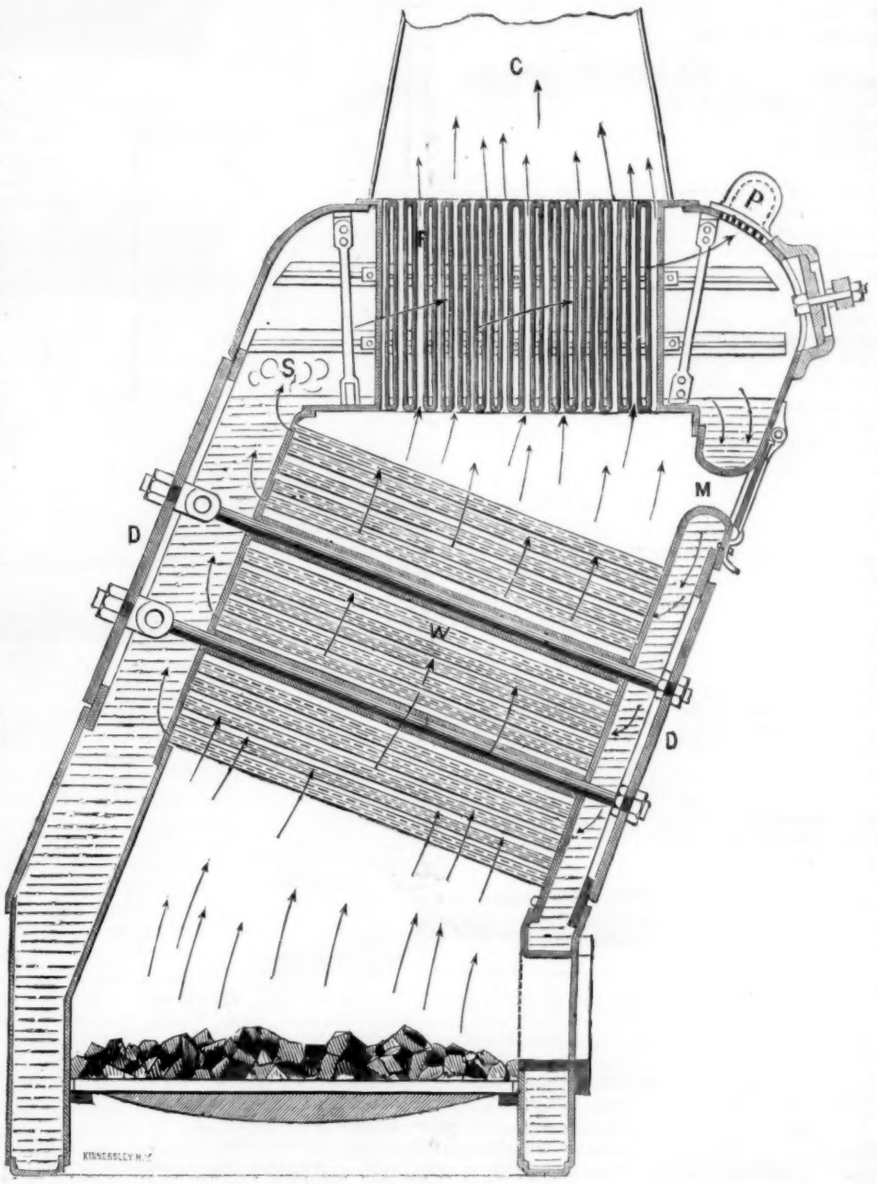
The meaning of the number on spools of thread is the number of hanks to the pound; each hank measures 840 yards.

Keep the oil holes of boxes plugged up and the bearings will wear longer.

Improved Steam Boiler.

In order to produce a perfect steam boiler three conditions must be complied with. First, The capacity to burn the largest amount of fuel in the smallest space and time. Second, The most complete absorption by the water of the heat produced; and third, The delivery from the boiler of the heat thus produced and absorbed, in pure *dry steam*, unmixed with any water held in mechanical suspension by the steam.

The accompanying sketch illustrates a boiler designed to fulfill these conditions. The inclined tubes above the fire are filled with water and connect the opposite water spaces of the boiler, while the vertical tubes are surrounded with water at their lower ends and with steam at their upper ends, the products of combustion passing through them to the chimney after having passed among and outside the inclined tubes below. The inclined tubes are about as long as the grate bars, and have spaces between them one half of their diameter, so that the draft opening is about one-third as large as the grate surface—the same proportion being maintained in the upper tubes; whereas one-eighth of the grate surface, or 16 square inches of opening to 1 square foot of grates—is a very common proportion for good working boilers. The capacity of the boiler to burn coal is therefore very large. When the heat is applied to the lower tubes the water at once begins to ascend through the tubes and up the back water space, and to descend down the front water space, which is unaffected by the heat; and the more rapid is the fire the more rapid will be that circulation. As steam is made, it rises with the water to the surface at S, where it bubbles up, as is usual in boilers charged with water mechanically suspended in it; but before this wet steam can escape from the boiler it is compelled to traverse the cluster of hot tubes which interpose between it and the steam pipe, P. These tubes operate to dry this steam by two methods; first, as a screen or sieve to which the water adheres as it is passed along; and secondly, by giving out the heat that is within them to the wet steam which is sweeping along on their exterior surfaces at right angles to the current of hot gases passing through them. The effect is, that when the steam reaches the pipe, P, it is superheated, and no water escapes with it to the engine. The degree of heat imparted to the steam will be controlled by the hight of the water in the boiler, which may cover any desired amount of the superheating surface, thus converting it into evaporating surface and reducing its superheating power. The water having lost its steam at S, descends through the water front as "*solid water*," and when the aperture at P is opened, no water under it can be drawn up and thrown out, because it is free of steam and is descending in a direction opposite to that in which it must go in order to pass out of the boiler.



DICKERSON'S PATENT BOILER.

One of these boilers, constructed for the *Idaho* steamship, has been in operation at the Morgan Works about a year, and has been subjected to a great variety of tests. It is found that the heat is so perfectly absorbed by the circulating water, that with a coal fire burning at the rate of 16 lbs. of coal an hour, on a square foot of grates, lead will remain without melting, although the fire is within eight feet, and the draft is straight up through openings one-third as large as the grates. In blowing off steam no water escapes, and the steam is blue and transparent for a considerable distance from the end of the pipe, thus showing that no heat is lost by working water.

As the sketch shows, the boiler is arranged with doors, D D, which may be easily removed, thereby giving access to both ends of the inclined tubes, for cleaning or repairing, while through the man-hole, M, the lower end of the fire tubes may be approached, and in the chimney the upper ends. Thus every part of the boiler, inside and out, is accessible.

This boiler was invented by Edward N. Dickerson, of this city. Patents have been procured in England and France, as well as in this country, and further information in relation to the invention may be obtained by addressing the inventor at 37 Park Row, New York.

SOUND.—The velocity of sound decreases with the temperature. At 10° it is 1106 feet, and at zero it is only 1093 feet per second.

The Mount Cenis Tunnel.

"Galignani" has the following, taken from a highly interesting article by Emile Level, in a late *Revue Contemporatne*, which gives some curious details about the piercing of the tunnel between Modane and Bardoneche. We quote:—

"It is well known that the whole length of the tunnel, when completed, will be 12,220 metres. The machine used for the purpose is M. Sommelier's perforator, set in motion by compressed air. It consists of a piston working horizontally in a cylinder, and carrying a chisel fixed upon it like a bayonet, which at each stroke dashes with violence against the rock to be pierced. Each time the chisel recoils, it turns round in the hole, and as the latter is sunk deeper and deeper, the frame or shield, which carries, not one, but nine perforators, advances in proportion.—While the chisel is doing its work with extraordinary rapidity, a copper tube of small diameter keeps squirting water into the hole, by which means all the rubbish is washed out. Behind the shield there is a tender, which, by aid of a pump set in motion by the compressed air, feeds all these tubes with water. The noise caused by the simultaneous striking of all the chisels against the rock is absolutely deafening, enhanced as it is by the echo of the tunnel.

All at once the noise ceases, the shield recedes behind it, and the surface of the rock is perceived riddled with nine holes, varying in depth between 80 and 90 centimetres. These holes are now charged with cartridges, slow matches, burning at the rate of 60 centimetres per minute, are inserted, and the workmen retire in haste. The explosion seems to shake the mountain to its base. When all is over the ground is found covered with fragments of rock, and an advance equal to the depth of the holes has been obtained. On the Bardoneche side this year the advance per month has been 50 metres; on the Modane side it has not exceeded 38 metres per month, owing to the greater hardness of the rock on that side. There still remains a length of about 8250 metres to be got through. When completed the tunnel will have required the piercing of 1,220,000 holes, 550,000 kilogrammes of gunpowder, 1,550,000 metres of slow match; and the number of bayonets rendered unserviceable will amount to 2,450,000.

Long Beards.

Hall's Journal of Health and the SCIENTIFIC AMERICAN, in their several spheres the most popular papers issued in this country, are advocating long beards. These journals seem to think that a thorough coating of hair adds beauty to "the human face divine." Whether that is to settle the question for the future for us poor male bipeds remains to be seen. For one, we intend to resist manfully before

we surrender—at least we mean before *our mouth is closed* like a backwoodsman's bear-skin powder pouch, to enter our solemn protest.

Do these reformers expect us to believe that a man appears best when his face is so disguised that one would as soon hunt for a mouth at the back side of his head as the front? For one we can't see it. What are we coming to? We have no suitable implements with which to feed ourselves in the event of this fashion becoming "the law of the land." But, hold! Yes, the thought has just occurred to us—we saw in the SCIENTIFIC AMERICAN a wood cut representing a spoon for this very purpose. The "bowl" and handle are formed in the ordinary fashion, and a strap of the same material passes over the top forming a sort of funnel. We could name several objections to this new invention, but we have a plan of our own much to be preferred to the patent *hair* spoon—and for one, when "worse comes to worse," we mean to adopt it—and as we do not intend to apply for a patent, all others are at liberty to make the most of our suggestions. These implements, like most improvements, are "cheap, simple and not liable to get out of repair," and now, presuming that the reader is fully prepared for the announcement, we say—for the more solid, nutrimental aliments the patent Sausage Stuffer is just the thing—and for those who indulge in whisky, lager, coffee, tea, buttermilk, &c., the instrument most resembling, but not technically styled, a squirt gun, would seem perfectly adapted. What say you, Messrs. *Hall* and *Munn?*

[We copy the above from the Tunkhannock, Pa., *Republican*. We think the suggestion a good one. Let it be tried by all means.—EDS.

Blockade Runners Captured in 1864.

We have a copy of the Report of the Secretary of the Navy for the year 1864, which contains among other things a list of the vessels captured in attempting to elude the blockade in 1864. The total number caught or destroyed is eighty-eight Of these seventy-eight were captured by merchant built steamers employed on blockade duty by the navy, leaving *only ten* captured by naval vessels proper. Of these ten two were caught in a sound or inlet where there was no escape, one by the *Sassacus*, and one by the *Sonoma*. Two others were taken, one by the *Kanawha* and others, and one by the *Matabassets* and others; but how many and what vessels were "the others" is not stated. One was caught by the *Minnesota*, a frigate of the old navy, and one by the *Pequot*, built by Mr. Wright not on the navy plans. Four out of the eighty-eight were caught by the new navy in the open sea and when the vessels were unaided in the capture; and only six in the open sea whether with or without aid.

We look in vain for the *Eutaw* and other fast naval vessels; their names do not appear; although when the *Eutaw* went into the blockade we were told that she would be heard from. What is the reason of this undeniable fact? Is it true that our naval vessels lack speed? What other explanation can be given?

Rag Boiler Explosion.

Wednesday, Dec. 21st, a boiler used for steeping rags exploded in a large paper mill in Troy, N. Y. The explosion was so violent that it blew down and destroyed a large brick building filled with machinery, breaking timbers a foot square into splinters, and doing damage to the amount of at least $40,000.

As rags are steeped under a pressure of 60 lbs. or more to the square inch, the explosion is no stranger than the explosion of any steam engine boiler. It doubtless resulted from imperfect construction or careless management. A small part of the $40,000 loss would have paid for a good boiler and would have hired a competent man to take care of it.

Big Oil Stories.

Oil wells have done big things in their day. The Phillips well has flowed two thousand barrels per day; Empire well three thousand; Sherman well fifteen hundred; Noble well fifteen hundred; Caldwell well eight hundred; Maple Shade one thousand; Jersey well five hundred; Coquette well fifteen hundred; Reed well one thousand."

We copy the above from an exchange, and would like to believe that the statements are all true; but our courage fails us just at the point of believing.

TURNING TOOLS.

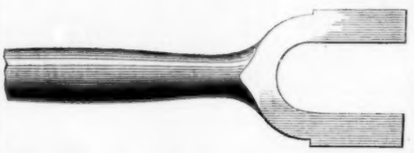
PART FOURTH.

With a roughing tool and a finishing tool any one can turn out good work with a little experience, and observation will supply from day to day much more instruction than we could impart in a page of this journal. In complicated work, or in places where ordinary tools cannot be used, it may be of some benefit to our readers to bear in mind what follows.

The forked end of a connecting rod is a difficult thing to turn nicely. It is not troublesome to roughhew it, to make plunges at it with a round-nosed tool, to make chatters in it, or leave it in such a state that it will take a finisher three or four days to file it up. But to turn the various corners neatly, to leave the edges sharp, and the outline without ridges, is a nice piece of work, and on no other job can the turner show his ability better.

This is the piece of work spoken of, and although it is quite simple in its appearance, it is very trouble-

Fig. 19.



some. It is flat on the face toward the reader, and unless the finishing and roughing tools are set at the proper angles, and well secured, they catch under the advancing edge and break off or jump in. Every mechanic knows what mortification it is to have a tool act thus; for when the surface has been finely finished elsewhere one unlucky mischance by catching may spoil the whole.

As the rod comes from the forge it is rough, and in heavy rods for marine engines, such as we now speak of, especially so. If it is troublesome to turn the rod it is bad to forge it, and the blacksmiths generally leave an abundance of metal.

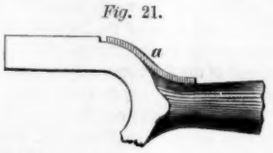
After the rod is laid out with the curves expressed on the drawing, and properly centered, the turner takes a square-nosed tool and runs in nearly to the lines all round, as in this diagram.

Fig. 20.

This roughs out to the outline neat and clean, and develops the shape perfectly. It is handier than any other method, because the workman knows exactly what he is doing. Instead of skipping about, taking off a lump here and a chip there, he goes steadily on to the end, and never makes one turn of the feed-screw handle without some advancement.

A square-nosed tool is better than any other for this purpose, because the edge, or corner, takes hold fairly and firmly, while the round nose, although it conforms to the curve better, is continually working or crowding off. When the tool has to be worked down a distance by hand, as in this diagram, it is

Fig. 21.

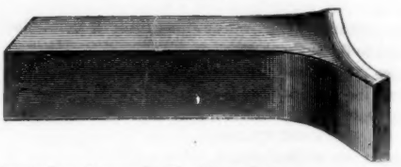


better to put in an ordinary roughing tool, with the feed in, and start at *a*, and cut it right down at once to the center punch marks denoting the outlines. In this way the lathe does much more work, for no man can feed as regularly and steadily, or as effectively, as the lathe itself can.

When the outline is once developed, and the ridges cut off by a bent side tool, the outline of the curves will present a surface consisting of a series of smooth-faced angles without a rough cut, a "dig," or a chatter upon them. After this it is an easy thing to cut off the tops of these angles, and make one fair and beautiful sweep of the whole outline. The surface will shine as bright as the face of a mirror, and be as true as a pair of dividers can lay it out. We know this because we have tried it.

The final finish can be well given by a tool con-

Fig. 22.



structed as shown in Fig 22, and the reverse curve as in this cut (Fig. 23). It must be borne in mind

Fig. 23.

that these tools have but little cut, or rake below, for the circle they cut on is very large and short, circumferentially, and a raking edge will jump in, while one too straight will push off. The linear length of the tool, or distance along the line of cut, should not be great, for the liability to spring is very greatly increased thereby. From two to three inches, and even less, ought to be sufficient for rods of ordinary marine beam engines.

Correspondence

A Well-expressed Compliment.

MESSRS. EDITORS:—Inclosed find $3 for the SCIENTIFIC AMERICAN for one year, commencing January, 1865. A journal that combines so much that is artistic and beautiful with so much that is valuable and instructive I wish every success. I appreciate harmony in every thing, and I love to associate external beauty with richness of soul.

Hoping that prosperity may ever be your portion, I am, yours very truly, WM. H STEVENS.

Fredonia, Dec. 18, 1864.

Influence of Colored Light on Sorghum Molasses.

MESSRS. EDITORS:—I take the following extracts from my memoranda:

Four cylindrical glass tubes, each of 1½ ounce capacity, and respectively of blue, red, green and yellow color, were filled three-fourths full with sorghum molasses, of a clear wine color, closed with cork stoppers, and exposed to the rays of the sun. After two months' exposure, the appearance was as follows:—The molasses in the red tube was covered with a moldy scum; that in the yellow tube had a flaky sediment; the molasses in the blue glass tub kept perfectly clear, and the peculiar taste of the sorghum was considerably diminished; the molasses in the green glass tube was similar to that in the blue, but not quite so perfect. The cork stoppers were removed; the scum in the yellow and sediment in the red tubes were also removed; the four tubes afterward covered with paper, to prevent the dust from falling into them, and exposed for two months longer to atmosphere and sun. A moldy scum appeared again in the yellow tube, a sediment in the red, while those of blue and green color remained clear as before. This experiment shows that molasses will keep best under the influence of blue color. The sorghum molasses contains a good portion of gum, also likely pectin.

The process of Prof. Goessling's patent, spoken of in Vol. XI., No. 25, consists, as I understand, mainly of a method adopted by Robert Philips, of Germany, published in No. 9, *Oeconomical News*, for the year 1843; also in Vol. I of Dr. Ludwig Gall's practical

communications to the agricultural profession, page 408, year 1855. The process is, 1st, Extracting the starch from the corn in the usual way; 2d, Converting the starch by diastase or malt into glucose; 3d, In another vessel converting starch into starch sugar, by aid of sulphuric acid. When sugar is formed in this way the glucose sirup is added to that boiling with sulphuric acid, to produce a more complete conversion of dextrine into grape sugar. The action of malt or diastase on starch will stop when 30 per cent of sugar is formed.—*Comptes Rendus*, December, 1861, Vol. III., page 1,217; A. Payen.

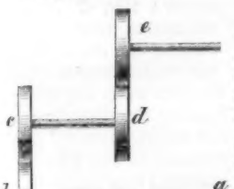
According to T. Musculus (*Comptes Rendus*, 1861,) only 33⅓ per cent of sugar is formed by the action of the diastase. T. A. Hoffmann.

Change Gears for Lathes.

Messrs. Editors:—I noticed in your issue of the 10th inst., a method of calculating the change gear of lathes, by Chas. E. Albro, of New York city. Your editorial hint to careful mechanics, at the end of the article, was well timed. Most machinists' lathes, with simple gearing, will cut just double the number of threads to the inch with the gearing mentioned in the examples of Mr. Albro.

I think Mr. Albro has overlooked the fact that most machinists' lathes, with simple gearing, are furnished with an auxiliary spindle called the change gear spindle or stud, which is generally, though not always, geared to move at half the speed of the main spindle of the lathe head. To obtain a correct solution of the problem it is necessary to take the movement of this auxiliary spindle in relation to that of the main spindle into the calculation; for instance, if, as in the case of Mr. Albro, 12 threads to the inch are wanted, and the change gear spindle moves at half the speed of the main spindle, it will only make 6 revolutions while the main spindle makes 12; consequently it must be 6 and not 12 which we multiply in order to get the correct relative proportion, or number of teeth, of the two gears required.

Example:—



Let a=the number of threads to the inch on the lead or feed screw; b=the number of teeth on the screw wheel; c=the number of teeth on the loose wheel of the stud spindle; d=the number of teeth on the fast wheel of the stud spindle; e=the number of teeth on the main spindle gear. Then the number of threads to the inch, which any change will cut is equal to $\frac{a \times b}{c \div (d \div e)}$ or $b\left(\frac{a \times \frac{d}{e}}{c}\right)$.

Let y represent the number of threads to the inch wanted, then—$c\left(y \div \frac{d}{e}\right) = b$ and $\frac{a \times b}{y \div (d \div e)} = c$

Let m represent any number used as a multiplier, then—$m\left(y \div \frac{d}{e}\right) = b$

and— $m \times a = c$

All that is necessary to calculate for fractions of threads is to convert vulgar into decimal fractions, and multiply in the same manner as you would for whole numbers. For compound gearing different equations are necessary, as the intermediate gearing has to be taken into the calculation also.

A. Buckham.

Newark, N. J., December 10, 1864.

[We understand Mr. Albro's rule to refer to lathes with simple gearing only, that is *one* intermediate between the spindle and lead screw; in which case the intermediate is of no importance. Modern lathes are made as Mr. Buckham states, but there are many old-fashioned lathes for common work that have but three wheels—one on the spindle, one intermediate, and one on the lead screw.—Eds.

Advantage of Deep Raceways.

Messrs. Editors:—I believe that the advantage of having raceways of considerable depth is not universally understood. Messrs. A. C. Seeley & Co., of Danbury, Conn., have a discharge raceway ninety rods long, from their water wheel to the river, eight feet deep, and ten feet wide on the bottom, and level. They use a Reynolds Water Wheel which takes 168 inches of water under 7 feet head, and the discharge raceway fills just 12 inches deep with water, when the wheel is in operation. In the winter season, experience has shown that it was a great advantage to have the raceway deep, as it kept clear of ice even in very severe weather. A. T. P.

HOW MILK IS CONDENSED.

In our last volume we published an article on Condensed Milk which gave some interesting general particulars. We find in the *Daily Tribune* some additional facts which are also interesting; we repeat for the benefit of our readers.

We will start from the platform where the cans are received from the farmer, and take the reader step by step through the whole process.

If the cans "pass muster," they are immediately emptied through a fine cloth or strainer into the receiving vat, which holds a thousand quarts. From that the milk flows through a pipe, and is drawn into brass pails which hold fifty quarts each. These stand in a flat tub capable of holding fifteen pails at once, which is filled with water that is heated by a coil of steam pipe. Here the milk is heated to 190°-195°, and in this first process of the work of condensing lies the whole secret of success. This was the discovery of Mr. Borden. He was not the originator of condensed milk. It had been thought of and processes patented before the date of his patent, but all had failed, because the albumen of the milk, if boiled in open kettles, burnt upon the bottom, and if *in vacuo*, coated the pipes and vessels, preventing perfect condensation, and, if heated too high, giving an unpleasant odor to the condensed milk. When thus cooked upon the inside of the condenser, the albumen became an insoluble cement, which required great labor to remove, and which, if not removed, would spoil the next charge.

In this water bath, in these open pails, the albumen is coagulated, without separation from the watery portion of the milk, and a little portion that adheres to the pail is almost instantly removed by placing the pail bottom upward over a steam jet, instantly followed by a strong water jet, in the same way that the farmers' cans are so perfectly cleansed. Until this plan was adopted, the work of cleaning off the coagulated albumen was very laborious. Now it is almost instantaneous.

This first process requires but a few minutes, and two men stand ready to hook a tackle to the pails as fast as the contents reach the proper temperature, and hoist them out of the bath and empty them through a fine brass wire gauze sieve into what is termed a "steam well." This is a copper vessel shaped like an egg, standing on end, with about one-fourth of the upper end cut off. This holds about seven hundred and fifty quarts—six and a quarter barrels. This well is made with a steam jacket over the lower end, so that the milk, which is already heated almost to the boiling point, is soon brought to that degree, and is then ready to go to the condenser.

The first boiling in the open kettle appears to be another of the requisites in the preparation for the final operation, as it gets rid of something in the milk that tends to make it foam in the boiler; and if there is any defect in the condition of the milk, it is exhibited here in this open kettle, and the deposit of albumen that takes place during the first boiling is easily seen and cleared off between the charges. There are two of these steam wells, with their accompanying water baths and receiving platforms. From these the milk is taken by what is generally termed suction, through tinned iron pipes, to the floor above where there are three condensers, or vacuum pans. These in form are somewhat like the steam well, the egg shape being complete—being four or five feet diameter, and holding one thousand quarts. In the upper part on one side, there is a window, through which strong sunlight, or lamplight, is reflected to the bottom, and opposite this there is an eye-glass, through which all the movements of the milk are seen, and by that means the boiling is regulated. There is also a manhole, through which a man enters after each charge is withdrawn, and scrubs the copper bright enough to almost see his face in it. The lid of the manhole being screwed on, the pan is to ready commence receiving a charge. The first operation is to start a powerful double-action air-pump, which exhausts the air in the vacuum pan until the gage shows twenty to twenty-five inches.

The cock in the pipe connected with the steam well is now opened, and the milk rushes up to fill the vacuum. This pipe, by the by, is inserted into the milk from the top, and does not extend quite to the bottom, so that if any sedimentary matter has accumulated there from the boiling, it is not taken up to the condenser. As soon as the first charge is drawn up, more milk is prepared ready in the well for the next demand. The steam is now let on, heating the coil of pipe inside, and the steam jacket outside of the condenser, the pumps being kept in continual operation, and the milk closely observed by the intelligent Yankee girl (one of the "mudsills"), who has charge of the pan, and prides herself in keeping it and all around as neat as she does her person, and all are faultless. In a few minutes she observes the thermometer indicate 190° and that the milk *in vacuo* is boiling rapidly. In open air at this elevation it would require 210°, and could not have eighty per cent of the water it contained removed, as is the case in the condenser.

As the boiling goes on, the milk continues to flow in, until 3,200 quarts have been taken up. Then the cock of the supply pipe is closed, and from this time the most watchful care of the attendant is required to keep the heat regular, and the pumps working perfectly. The pumps stand upon the lower floor, where a stream of cold water flows upon the air chamber, and condenses the steam vapor drawn from the boiling milk into water, which is discharged into a stream constantly flowing through the building. This condensed vapor constantly emits that peculiar odor that we perceive in milk warm from the cow, or during the operation of boiling, and which contains the germ of putrefaction. When the charge of 3,200 quarts shows by the gage that it has been reduced to 800 quarts, it is ready for the final operation of purification. The steam is shut off, and its place filled with cold water, the effect of which is to condense the vapor in the air-tight pan, and thus diminish the pressure. This increases evaporation, and the effect is to throw off all the remaining odor, through the discharge of the pumps. This often has such a fetid, sickening smell, that it pervades the atmosphere all around, and affords one of the most convincing proofs of the value of the process that discharges such a substance from our daily food.

From the time the milk is received from the wagons until it is finished in the condenser, about three and a half hours are required for all the operations. It is then drawn into ordinary milk cans, and these are placed in an ice bath in the lower room, and require an hour and a half to become perfectly cold. It is now ready for shipment to the city. In summer time it is kept icy cold by means of an "ice core," that is a tin tube filled with ice, inserted in the cans, occupying about one-fourth of the space. Ordinarily, the milk drawn from the cows night and morning is condensed during the day and shipped at night, and delivered to city customers the next morning at thirty-two cents a quart.

It is a very curious fact that although only four quarts are condensed to one, when pure water is added to reduce the article again to milk, it is invariably found that it requires four quarts of water, and that the milk is then better than what is really pure milk, as drawn from the cows, and far better than much that is sold as pure milk.

The Pneumatic Loom.—Mr. T. Page, C. E., reports on a new system of weaving by compressed air in the pneumatic loom. The improvement will affect the working of nearly 500,000 power-looms, the labor of more than 775,000 persons and the manufacture of about 1,200,000,000 lbs. of cotton alone. The principle upon which the new loom acts is that of discharging a jet of compressed air from the valves of the shuttle-box, upon the end of the shuttle, at each pick or stroke, and thus substituting for the imperfect motion of the "picker" the pneumatic principle, simply applied. The working velocities will be in proportion of 240 strokes by the new machine per minute, to 180 strokes of the old in the same time. This improvement applied to the whole of the power-looms of the United Kingdom would represent a total increase of 1,400,000,000 yards over the produce of the same number of machines.

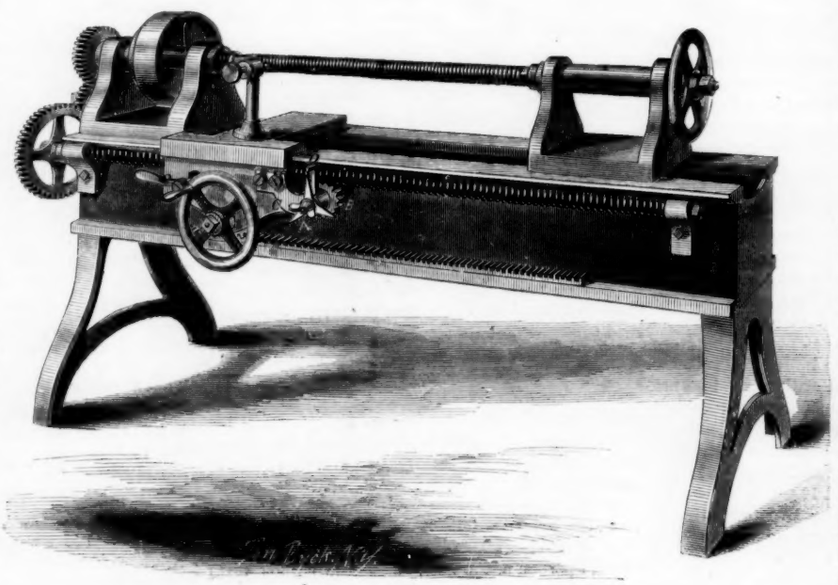
Improved Screw Cutting Index.

All lathemen who have cut screws know that the tool sometimes rides on the top of the thread unless it happens to come in exactly the right place. When the carriage is run back by a cross belt, the tool always comes in the right place, for the relative positions of the tool and the thread are unchanged. It consumes time, however, to do this, and very many mechanics prefer to throw the feed out, run the carriage back by the hand wheel, and jump the tool in as the thread comes round.

The object of this invention is to make the operation certain, for it sometimes happens that the most skillful workman hits the top of the thread and strips it off for a turn or so before he can run the tool back. The index here illustrated consists in affixing a three fingered pointer, A, to a shaft, whereon a wheel, B, is keyed. This shaft runs in a bracket, C, bolted to the apron of the lathe. The wheel is in contact with the lead screw, and when this is in operation the pointer remains stationary.

Now supposing the cut to be started, the pointer will be opposite the vertical arm, D, also on the bracket, and will remain fixed while the feed is in. When the tool has traversed the length of the work the feed is then thrown out and the carriage run back by hand, and when any one of the pointers come opposite the vertical arm the feed is thrown in and the tool can be run in with a certainty that it will also strike the center of the space. This is a very convenient arrangement and can be applied to any lathe in a short time; when not in use it can be detached and laid on one side.

It saves half the time, also the use of an extra belt and one or more pulleys on the counter shaft, and is not liable to derangement. It was patented on Nov. 1st, 1864, through the Scientific American Patent Agency, by J. G. Baker, of the firm of Henry Asbury & Co.; for further information address the above firm, at Nos. 67 and 69 Laurel street, Philadelphia, Pa.



BAKER'S SCREW-CUTTING INDEX.

Gunpowder Explosive by Percussion.

Knapp, in his Chemical Technology, says,

"The inflammability of dry powder by a mere blow without fire is a well known fact, and has more than once been the cause of accidents. That this property is not always due to an accidental mixture of other matters, as sand, &c., but is really a property of the powder itself, was proved by the experiments instituted at Freiberg with blasting powder made from chemically pure ingredients, namely, 63.3 saltpetre, 20.0 sulphur, and 16.7 charcoal. Out of ten samples, which were wrapped in paper, and struck upon an anvil with a heavy hammer, seven of the corned powder exploded, and nine of the powder in the form of flour. Other kinds of powder behaved in the same manner. It is of importance, in the construction of powder mills, to know that the explosion occurs most easily by a blow from iron upon iron, iron upon brass, brass upon brass, even lead upon lead, and lead upon wood, but not so easily from copper upon bronze or upon wood."

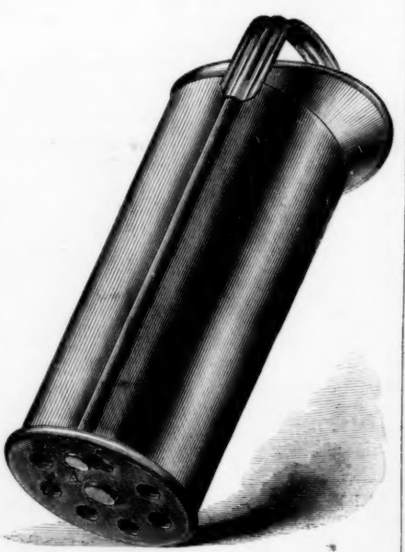
Some time ago some persons who were boring for oil in Wirt county, in West Virginia, and had reached a great depth, dragged up with the pump a piece of calico. The operators were very much astonished at the discovery, and the people in the neighborhood were induced to believe that some persons down in China were sending up specimens of their calico printing.

ANCHOR ICE.

Water is at its greatest density at the temperature of 39°·7 above the freezing point. If water, warmer than 39°, is cooled at the surface, this surface water becomes denser than the remainder and sinks to the bottom. By this process the whole body of the water is cooled to 39°, when any further cooling of the surface makes the water less dense, and it remains till it cools to 32°, when it crystallizes into ice. Were it not for this singular property, the whole mass would be cooled to 32°, and frozen solid. Sometimes when water runs in shallow streams over a rocky bed, it is so mixed that the whole may be cooled to 32°, and the freezing may begin at the bottom, producing what is called anchor ice. This we have supposed to be the correct explanation, but a correspondent from Maine speaks of anchor ice occurring in ponds. If it is really observed in deep still ponds some other explanation must be sought.

CADWELL'S PHOSPHATE DISTRIBUTER.

This utensil is intended to facilitate the distribution of fertilizers on corn, cotton, tobacco, or other plants; either plaster, ashes, lime, salt or phosphates may be used in it. It can also be employed for depositing guano, bone dust, etc. in the hill before planting.



The quantity let on at once can be graduated from a thimbleful to a handfull, and a simple jolting or shaking motion is all that is required to work it. By the employment of this utensil the fertilizer is scattered evenly instead of in lumps or spots, as is the case in more imperfect methods. The garments and person are also fully protected from contact with the noxious and destructive, as well as disagreeable, agents sometimes used. It also expedites the work and is in other respects advantageous. The arrangement is simply a tin case with a perforated bottom, as shown in this engraving, which is covered with a slide, also perforated. On turning the inner slide by the button, A, the apertures are increased or diminished at will, thus regulating the quantity of fertilizer deposited. Any tin smith can make one in a short time. It was patented, through Scientific American Patent Agency, on the 17th of Nov. 1863, by J. R. Cadwell, Dexter, Mich For information concerning rights, etc., address him at that place.

The Ames Gun.

The wrought iron cannon made by Mr. Ames at Falls Village, after having been fired 700 times to test its strength with such immense charges of powder and balls and shells, that Gen. Gilmore, it is said, stated that it was the most severe test any gun was ever subject to without exploding, it is to be tested still further. It is said the government agents have purchased the gun for the purpose of experimenting upon. They intended first to bore out and enlarge the caliber; this, of course, will tend to greatly weaken the gun, and also to admit still greater charges.

Should it then stand the tests which they design to apply, they think of dissecting the animal by cutting the entire gun into thin slices by means of powerful machinery which is estimated to cost $10,000—these slices to be closely examined with a magnifier, for the purpose of finding whether there are any unwelded spots or flaws in the construction of the gun, and also to find if the severe tests which have been applied have caused any slight cracks, or even separation of the particles of iron, which might not be visible on the outer or inner surface. Mr. Ames has completed 10 or 12 other guns like the one above alluded to, which are to be tested this week near his foundery. It is said that the government has contracted for them, and that they are to be put to immediate use. Jeff Davis will then probably hear something he won't like.

The iron of which these cannon are made is the pure "Salisbury Iron," and was smelted from the ore of Messrs Landon, Botsford & Co., at Chapinville in this town, and is what is known among iron dealers as "cold blast charcoal iron," and was received by Mr. Ames in the form of cast iron pigs, and by him converted first into wrought iron, then into the best cannon ever made in America and probably the whole world.

Emigration a Loss to Cotton Spinners.—Mr Heywood, the Secretary of the Cotton Supply Association, estimated by a division of the margin of wages and profits in 1860, that the sum of £81 would be lost to the trade for every working hand that emigrated. The emigration of 50,000 hands would, at this rate, involve a loss of £4,000,000 a year. He maintained that it would be better to keep 600,000 hands at a weekly cost of 2*s.* 6*d.* each, for three years, with a total expenditure of £12,000,000, than to incur a direct loss in that period of £147,000,000 in wages and profits.

It is claimed that our telescopes are now perfect enough to discover any dwelling over 40 feet high on the moon.

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VOL. XII. NO. 4....[NEW SERIES.]....*Twentieth Year.*

NEW YORK, SATURDAY, JANUARY 21, 1865.

Contents:

(Illustrations are indicated by an asterisk.)

DEFECTIVE IRON CASTINGS.

It is not uncommon to see large iron castings constructed with little or no attention to the expansion and contraction of the several parts. Examples of the practice in question may be found in stationary engine frames. Cumbrous pillow blocks are cast upon them and immediately beneath is a large opening surrounded by sundry "filagree arms, scrolls, and similar articles," which, in the pride of his heart, the designer intended for ornaments. Still other instances of defective castings may be found. In turbine wheels, the step-frame, or that part which carries the weight of the wheel and shaft, frequently has large and heavy parts contiguous to light and thin ones. Large band wheels or pulleys are also examples, for from the solid hub and heavy rim spring light arms very much less in size and weight than the part to which they are attached. Car wheels of some patterns are open to the same charge, and many designs have been originated with a view to correct the fault. That it is not a trivial matter is shown by the results consequent upon malconstruction. Where the drivers of locomotives have cranks cast on them the two arms which run to the eye of the crank are sure to break in a short time, and an outside connected locomotive can hardly be found that has not these two arms broken at the points designated. Even if the the force of the steam were not exerted at that particular point the jar and tremor when running would tend to disrupt the arms from the crank.

Iron bridges are sometimes made, whereof the girders and other parts under strain are cast with such a manifest inattention to the simple and well known law herein before alluded to, that the structure has given way and the public have condemned a system for the fault or ignorance of an individual. Many castings for different purposes, some to be employed in transporting passengers, some for purposes of commerce, are weak and fragile from the moment they are dragged out of the sand, because no regard has been given to a proper distribution of the strain of expansion and contraction. If these castings be struck with a hammer, the light parts will give out a clear high note showing the tension to be great.

It is not only the breaking strain which is a consequence of bad proportion but the difference in the quality of the iron composing the whole. Though the cupola may have been charged with metal of one kind the casting will not be alike when thick and thin parts are contiguous. Large masses of iron cool more slowly than small ones, the crystals are, therefore, coarser and the metal less tenacious than small quantities of it, and it is, therefore, ill calculated to withstand torsion, compression or tension, and many accidents that are apparently mysterious could no doubt be traced directly to defective distribution of the shrinkage.

PUBLISHING INFORMATION OF GOVERNMENT WORKS.

The London *Star*, of Dec. 20, has a letter addressed to a member of Parliament by a British field officer who was traveling in this country. From the letter we take the following extract:—

I visited the famous foundery for casting Parrott guns, and the whole process was explained to me by the proprietor. I saw a 300-pounder cast, and was told the establishment could produce three guns per day. The strengthening the guns by bands or coils seems to have been so successful that (as I was told) no accident had happened to a "Parrott" in either the military or naval service. I also visited a manufactory of seven-shooters, not revolvers, but rifles, loaded through the butt, each cartridge being forced up by a wire similar to what we see used in carriage lamps. I inquired respecting these guns when I was with the army. In action they lead to a waste of ammunition, especially in the hands of raw troops: but they are very destructive when entrusted to known cool shots, and would enable a very few men to defend a narrow pass, a gateway, etc.

This courtesy to foreigners, and especially to foreign officers, is in accordance with the general practice of our Government, and we think it is perfectly proper. Our institutions demand the utmost publicity in regard to all Government acts, and it would be almost impossible to conceal anything connected with our armories and fortifications if the attempt were made. It is, therefore, just as well to take the benefit of politeness and candor, and frankly explain everything to the officers and engineers of all foreign nations.

But as long as this is done, is it not improper to throw obstructions in the way of our own people obtaining the same knowledge? They are the persons who have paid for all of these things, and who pay the officers for taking care of them. If the construction of our arms and the machinery for manufacturing them is made known to the restless, fertile minds throughout the nation, improvements will be more likely to be suggested than if this knowledge is confined to the army officers in charge and the few who understand the art of conciliating their favor.

These remarks are suggested by the recent order of Gen. Dix, requesting the papers to publish no information in relation to our forts. It seems to us that more mature deliberation must induce Gen. Dix to withdraw this request. If there is any special improvement which it is desired to keep secret, let regulations be adopted so universal and rigid in their application that they will prove efficient, but it is certainly for the good of the service, as well as right and proper, that whatever is exhibited to the agents of foreign governments should be laid open as fully and freely to our own people.

PETROLEUM AND ASPHALTUM.

Linseed oil, and several other vegetable oils have the property of absorbing oxygen and combining with it chemically to form resin. It is this property of drying oils which renders them suitable for paint.

Petroleum contains no oxygen; it is composed wholly of carbon and hydrogen, being a mechanical mixture of several hydrocarbons. Asphaltum is a resin, being composed of carbon, hydrogen and oxygen, and it has been suggested that asphaltum is produced by the conversion of petroleum into a resin by the slow absorption of oxygen.

But this is a mere hypothesis. No one claims to have succeeded in converting petroleum into asphaltum. After months of exposure the oil remains without any appearance of resin even upon its surface. It is as reasonable to suppose that under certain conditions the vegetable matter is converted directly into asphaltum, as that it is changed first to petroleum and then to asphaltum.

Asphaltum lakes may suggest the presence of petroleum in the vicinity, but they are no proof of its presence.

SWEET BRIAR.—H. Springler, of the U. S. Naval Machine Shop, Port Royal, S. C., writes us that sweet briar is very plentiful in that region, but for want of information how to prepare it no use is now made of it. He solicits information on the subject.

GROVE ON HEAT.

We recently noticed Dr. Youman's collection of treatises on the Conservation and Correlation of Forces, published by D. Appleton & Co. The first and longest treatise in the collection is that of Professor Grove.

He regards heat as a mode of motion, but takes a simpler view of it, perhaps, than is taken by any other philosopher. He says that all we know of heat is expansion and contraction. A body in cooling contracts, and this expands other bodies in its vicinity, or subject to its influence.

Professor Grove argues at great length against the hypothesis of an ethereal fluid, contending that heat is simply motion in ordinary matter. It seems to us that all of this argument is against a fancied distinction.

If the sun acts on the earth, it must be through the medium of a material connection between the two. Sir Isaac Newton regarded the denial of this as a proof that the mind of the person denying it failed to comprehend the problem. The space between us and the sun is occupied by matter, and this matter is an exceedingly attenuated fluid. Each of the sixty-four elements at present known has properties peculiar to itself. It may be that the fluid filling the interplanetary spaces is composed of the vapor of these elements, or it may be some element lighter than hydrogen; in either case, if Professor Grove chooses to call it ordinary matter, we suppose no philosopher would insist upon calling it extraordinary matter.

Professor Grove not only denies the existence of a pervading fluid, but also takes ground against the vibratory theory of heat; insisting that all of its observed phenomena are simply expansion and contraction. One body in expanding causes others to contract; one body in contracting causes others to expand. A body in what we call giving out heat is contracting; when it is undergoing that process which we call absorbing heat, it is simply expanding, in consequence of the contraction of some other body. Such, if we are able to understand him, is Professor Grove's notion of heat.

POLISHING LINEN THREAD.

At Mechanicsville, in this state, there is a manufactory of linen thread. For several years after it was started the business was unprofitable, but a new superintendent was obtained who conducts the operations with intelligence and energy, and now the company makes regular dividends. All of the flax is bought in Holland, the Dutch understanding the rotting and preparation of flax for thread better than any other people. We believe the flax for thread is cut before the seed ripens. At Mechanicsville the flax is all hatcheled by hand. It is then spun into raving like cotton, and passed through a drawing frame, after which it is placed on a spinning frame to be spun into thread. As it goes from the bobbins upon the spindles it passes through hot water, and the spinning room is dripping with moisture.

A beautiful polish is given to the thread by a curious process. After the thread is reeled in skeins, a stout workman takes a bunch as big as his arm, and catches it upon an iron hook; then, passing a stiff stick through the opposite end of the loop, twists the thread tightly with all his might. Immediately untwisting it, he catches it in another part upon the hook, and gives it another twist. A few repetitions of this process impart to the thread a most beautiful, smooth, silken finish.

Piston Speed of Screw Engines.

The English iron-clad *Valiant* has double engines of the same kind as those in our sloops-of-war. They are 82 inches in diameter, 48 inches stroke, and make 60 revolutions per minute without difficulty. The screw has a fine pitch ranging between 22 and 27 feet, and can be altered between these two figures without stopping the engines. The engines of the *Re Don Luigi Di Portugallo*, Italian iron-clad, built by the Morgan Iron Works, this city, are 84 inches diameter by 48 inches stroke, and have made 55 revolutions per minute, but the pitch of the screw is 31 feet 6 inches, which is materially against a high piston speed.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING JANUARY 10, 1865.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

45,805.—Lamps.—James Adair, of Pittsburgh, Pa.:

I claim, first, The construction of the screw, k l, with a flattened spheroidal or lozenge-shaped chamber, B, about it, substantially in the manner and for the purpose described.

Second, Making the spheroidal chamber of open work or perforated plates, substantially in the manner and for the purpose described.

Third, Constructing the spheroidal or lozenge-shaped chamber of the cone, a, with a screw, d', box, e, with tube and wick-adjuster, substantially in the manner and for the purpose described.

Fourth, The combination of two or more spheroidal or flattened chambers, substantially in the manner described.

Fifth, The combination of my specified insulator with a lamp, substantially in the manner and for the purpose described.

45,806.—Igniting Hand Grenades.—John S. Adams, of Taunton, Mass.:

I claim the combination of the recess, E, the metallic disk, D, the hook slot, F, the water-proof cap, G, and the opening tape, H, all arranged substantially as and for the purposes set forth.

45,807.—Cultivator.—W. D. Ament, of Muscatine, Iowa:

In combination with the standards, D D, adapted to be operated by treadles so as to move the plows vertically and laterally, I claim the adjustable blocks, G, resting upon the plates, E, and employed to vary or regulate the depth to which the plows penetrate the ground, in the manner herein explained.

[This invention relates to a new and improved cultivator, of that class in which the shovels or shares are rendered adjustable, in a lateral and vertical direction.]

45,808.—Machine for Manufacturing Cigars.—Jonathan Ball, of Elmira, N. Y.:

I claim, first, The use of a wire, c, and tamper, F, perforated through its longitudinal center, as described, in combinat on with the mold, c, or its equivalent, and with a suitable wrapper, constructed and operating substantially as and for the purpose herein described.

Second, Also the method, substantially as herein described, of introducing the filling of a cigar around a central wire, for the purpose of producing a central draught.

Third, I claim manufacturing cigars by first inserting the wrapper into a mold and afterward filling in the tobacco, substantially as herein specified.

Fourth, In combination with a machine constructed as herein described, I claim the cup or funnel, G, employed to hold the wrapper in position, and admit of the introduction of tobacco after the tamper is inserted, as explained.

[The object of this invention is an improvement in that class of cigars, which are made with a paper wrapper, and commonly known under the term cigarettes.]

45,809.—Manufacture of Glass.—John Best, of Pittsburgh, Pa.:

I claim the use of the ingredients hereinbefore described which I call granular marble, as a substitute for slaked lime or oxyd of lead, in combination with the other ingredients composing the batch or mix, as hereinbefore specified, or some of them, or their equivalents, in the manufacture of crystal glass, substantially as hereinbefore described.

45,810.—Harvesters.—Jacob W. Bope, of St. Louis, Mo.:

I claim, first, The levers, D D, radiating from movable centers, in combination with the segments, arranged on the main frame, for effecting a perpendicular up and down motion of the finger bar, in front, as described.

Second, I claim the combination of the levers, D, the hinged stirrups, E, and the segments, C, for attaching and moving the finger bar, in the manner described.

Third, I claim raising and lowering the reel, by means of the levers extending under the shaft, and connected with the finger bar, as described, whereby the reel is kept equidistant from the cutting mechanism, as herein set forth.

Fourth, I claim the arrangement of the sliding friction roller, f, on the lever arms, a a, as and for the purpose herein described.

45,811.—Corn Harvesters.—Jacob W. Bope, of St. Louis, Mo.:

I claim, first, The sliding rod, f, or its equivalent, provided with a foot lever, in combination with the guide, G, and hinged table, E, substantially as and for the purposes specified.

Second, I claim the reel, F, provided with six or more straight arms, having one or more wires running through them, said wires crossing each other, or being bent to form such angles, that the stalks are gathered and discharged with ease and certainty, substantially as shown and described.

45,812.—Coupling Thills to Carriages.—D. C. Breed, of Lyndonville, N. Y.:

I claim the eccentric bolt, C, provided with cams, a a, in combination with the jaws, b b, thill hook, d, and packing, E, substantially as and for the purpose herein set forth.

I also claim securing the eccentric bolt in place, when thrown back, by means of the depression, g, formed partially in the jaw and partly in the cam, a, into which depression fits the rim, b, of the nut, G, the whole arranged and operating substantially as and for the purpose herein specified.

45,813.—Paper File.—William Burnet, of New York City:

I claim a file made of two leaves secured together by a hinge bar, and kept together by means of spring pressure thereon, all made and operating substantially as above described, or their mechanical equivalents.

45,814.—Ventilator.—Benajah J. Burnett, of Mount Vernon, N. Y.:

I claim a ventilator composed of an upright trunk, A, divided into chambers, a a, having openings, e f, above and below the roof, with opposite inclined deflectors, c d, substantially as herein specified.

And I also claim the hinged shutters, g g, with their attached brackets, h h, so applied in combination with the upper openings, e e, of a ventilator of a construction substantially as herein described, that when open the said shutters form deflectors, to encourage the entrance of air into said openings, substantially as herein specified.

45,815.—Car Springs.—Wm. Cox, of Philadelphia, Pa.:

I claim the tapering springs, D D, secured to the sills, b b, of a railroad car truck, and resting upon lips, a a, projecting from the journal bearing, C, all being arranged to operate in the manner and for the purposes herein described.

[This invention consists in applying wooden or steel springs, or both, to a railroad car, in such a manner that the weight of the car is distributed or transmitted to the bearings of the axles from each end, and from the center of the car at each side of the same, and a very simple, durable, cheap and efficient spring obtained.]

45,816.—Spinning Top.—Louis Cramer, of Brooklyn, N. Y.:

I claim a notch, e, in the hollow arbor, b, in combination with the ratchet teeth, g, on the barrel, c, which incloses the spring, d, and with the pin, f, projecting from the shank of the top, constructed and operating substantially as and for the purpose set forth.

[This invention relates to an improvement in that class of opening tops in which a spring is employed, for the purpose of imparting to the top the desired whirling motion.]

45,817.—Seeding Machine.—W. H. Crichton, of La Porte, Ind.:

I claim the rotating-pointed wheels, J, fitted on a shaft, I, within the seed box, H, with double-inclined planes, c c, between them and the wheels, working in recesses, b, in the rear side of the seed box, in combination with the fixed perforated plate, L, and the adjustable perforated plate, M, at the rear of the seed box, all arranged substantially as and for the purpose set forth.

[This invention relates to a new and improved broadcast seeding machine, and it consists in a new and improved means employed for discharging the seed and graduating its discharge.]

45,818.—Piano-fortes.—David Decker, of New York City:

I claim the construction of the agraff used in piano-fortes, substantially as herein described, whereby the face of its head, which is toward the hammers, may be flush with or project slightly beyond the edge or face of the wrest plank, while its screw is entirely inclosed in the wood of the said plank, and a sufficient supporting thickness of wood is left on the outer side of it to obviate the necessity of securing it into the iron plate.

45,819.—Pocket-book.—J. Fred'k. Dubber, of Brooklyn, N. Y.:

I claim a pocket-book, provided with a strip of steel, d, in the edge of its closing flap, c, as a new article of manufacture.

45,820.—Valves for Steam Engines.—Oscar T. Earle, of Springfield, Mass.:

I claim, first, A cylindrical slide valve, constructed with one or more ports through it, the said port or ports leading behind the ends of the valve into the steam chest, and at proper intervals coinciding with ports of the valve seat, substantially as and for the purposes set forth.

Second, The arrangement of ports, F and F', with piston, B, and valve, F, when operating substantially in the manner and for the purpose herein described.

Third, The arrangement of the ports, K and K', with the ports, I and I', and valve, E, when operating substantially as herein described.

45,821.—Machine for Clipping Hair or Wool from Animals.—Charles W. Emery, of Dorchester, Mass.:

I claim, first, A series of shear blades attached by pivots to a circular cutting plate, in combination with a circular undulating path cam, formed in such a manner as to give a vibratory motion to the shear blades, substantially in the manner and for the purpose herein described.

Second, I claim the device herein described for rotating the circular cutter plate, and locking and unlocking it at proper intervals, so that it may remain at rest while the cut is being performed, and again revolve while the blades are open, substantially as herein set forth.

45,822.—Tube Packing.—Samuel L. Fox, of Philadelphia, Pa.:

First, I claim packing pump tubes of oil and other wells, or other tubes, or pipes, by means of a movable packing case, with expansible sides, substantially as above described.

Second, I also claim the packing case, Q, constructed and operated substantially as above described.

45,823.—Harvesters.—Daniel D. Gitt, of Arendtsville, Pa.:

First, I claim mounting the friction roller upon the pin which unites the connecting rod with the sickle, when the said roller occupies a central position in relation to both, as shown and described.

Second, In combination with the above, I claim the employment of a box closed on top, for the double purpose of guiding and protecting the anti-friction connecting device, substantially in the manner described.

45,824.—Head Blocks for Sawmills.—Ira Hart, of Clarksburgh, West Virginia:

First, I claim the sliding knee, B, and clamp, H, in combination with the link, G, and shaft, E, or their equivalents, when constructed substantially as and for the purpose specified.

Second, The combination of the clamp, H, guide, I, and spring, M, when constructed substantially in the manner and for the purpose specified.

45,825.—Combined Seeding Machine, Roller and Drag.—W. H. Hartman and Samuel Sheller, of Fostoria, Ohio:

I claim the special arrangement of the jointed dray, F, lever, G, chains, g h, in combination with the seeding apparatus and adjustable rollers, B B, when arranged and operating as and for the purpose set forth.

45,826.—Machine for Loading Hay.—S. Ross Higgins, of Parma, Mich.:

First, I claim the turn table, G, placed on a mounted framing, A, and having a fork bar, J, connected to it, be operated by means of a rope, N, under the action of the draught animal, substantially as and for the purpose set forth.

Second, The guard, M, with its forward and rear bars, I' and l, and pivoted to the fork bar, J, in combination with the pivoted fork, K, and the rope, N, by tension, in which the guard is pressed down upon the hay, the whole arranged substantially as and for the purposes described.

Third, The caster wheel, C, when used in combination with the framing, A, turn table, G, fork bar, J, and fork, K, for the purpose described.

Fourth, The bar, Q, on the rope, N, in connection with the notch, o, in the shaft, H, and the rope, E, and spring, S, for the purpose set forth.

[This invention relates to a new and improved machine for loading hay on wagons, from cocks or windrows on the field, and it consists in applying an adjustable fork to a turn-table placed on a mounted frame, and provided with a guard and connected with a draught animal, in such a manner that the machine may be drawn from place to place with facility, the fork lowered and adjusted to its work, and then raised with its load over the wagon, and the former discharged into the latter, the labor being performed by the draught animal, the attendant simply guiding or manipulating the parts during the loading operation.]

45,827.—Reaping and Mowing Machines.—Oliver T. Holbrook, of Rushville, N. Y.:

First, I claim the combination with the main frame, c, constructed as described, of the secondary frame, D, and plate, B, arranged and operating in the manner set forth.

Second, The cutters, K, formed with a slit in the rear, as shown and described, when arranged upon and secured to the bar in the manner specified, whereby one part of the rear end thereof is elevated above the other, for the purpose and in the manner set forth.

45,828.—Manufacture of Steel.—Edward P. Hewson, of Washington, D. C.:

I claim the manufacture of cast-steel by combining decarbonized iron, prepared substantially as herein described, with pig or other carbonized iron, as herein specified.

45,829.—Tallying Machines for Measured Grain.—Sidney Hudson, of Milford, Mich.:

I claim the combination and arrangement of the several parts which produce the result, in the simple concise and effective form described.

I claim, first, The circular hopper slide, L, as attached to oscillating plate, E, which works dog, d, as described; also crank, C, the journal of which passes through a slot in plate, B, and is attached near the edge to ratchet, R, which is held from turning back by dog, S, which prevents slide, L, being closed without tallying, when the parts are arranged to operate as and for the purpose described. This combination will work several varieties of registers.

Second, I claim the combination of the ratchet wheel, E, with cog wheel, H, which works over the center of E; also cog wheel, x, which gears with H, and works near the edge of E, one cog at a time extending beyond the edge of E, which, at every revolution of E, comes in contact with stop, I, by which wheels, x and H, are moved forward one point on their respective dials.

I also claim spring, D, which is used to keep the machinery in place, when arranged in combination as and for the purpose herein shown and described.

45,830.—Cartridges.—Samuel Jackson, of Philadelphia, Pa. Ante-dated Jan. 3, 1865:

I claim the combined paper and metallic cartridge case, when constructed and arranged to operate substantially as set forth.

45,831.—Root-cultivator and Weeder.—Charles Jarvis, of Ellsworth, Maine:

I claim, first, Constructing the front edges, n, of the sides, g g, of the cutters, G, so as to project beyond the latter, substantially as and for the purpose described.

Second, The cutters, G, arranged as described, in combination with the bar, A, tongue, B, and wheels, F, substantially as and for the purpose specified.

45,832.—Bed Bottom.—Frank G. Johnson, of Brooklyn, N. Y.:

I claim the peculiar manner in which the cord is laced into the frame, A B C D, so that no two consecutive cords are parallel to each other, substantially in the manner and for the purposes herein set forth.

45,833.—Cultivators.—Adam Keck, of Montgomery, Ill.:

I claim, first, The attaching of the axles, C, of the wheels, B, to plates, D, secured to castings, E, at the under side of the framing, A, by means of bolts, a, passing through oblong slots, c, in the castings, substantially as shown and described, to admit of the wheels, B, being adjusted further forward or backward, to keep the machine in a proper equipoised state, as set forth.

Second, The plow beams, G G, provided at their front ends with upright bars, g, connected by joints, h, to the castings, E, and provided at their back ends with upright bars, H, having each a notch, i, to receive a catch, I, all arranged substantially as and for the purpose set forth.

Third, The springs, K, on the back part of the framing, A, in combination with the upright bars, H, of the plow beams, G G, as and for the purpose specified.

Fourth, The attaching of the plow beams, L L, by means of the uprights, M, and joints, j, to the pivoted plate, N, arranged on the framing, A, substantially as shown, to admit of the working or moving of the plows, Q, as set forth.

[This invention relates to a new and improved implement for plowing or cultivating corn and other crops which are grown in hills or drills, and it consists in a novel arrangement of the plows, or in the manner of applying them to the frame thereby, whereby they may be manipulated with the greatest facility while at work, and the invention further consists in an improved mode of attaching the wheels to the framing of the machine, whereby the former may be kept in a properly counterpoised state at all times, and the team relieved from any unnecessary downward pressure of the draught poles.

45,834.—Mode of Constructing Railroad Car Trusses.—Joel F. Keeler, of Pittsburgh, Pa.:

I claim the railway car truss, constructed and used substantially in the manner and for the purposes set forth.

45,835.—Feathering Paddle Wheel.—Geo. A. Keene, of Newburyport, Mass.:

I claim arranging the floats of a paddle wheel in pairs at right angles to each other, one at each end of a shaft passing through the center of the wheel, so as to present more area on one side of said shaft than on the other in order that the one float, entering the water flatwise, in passing through the same shall gradually turn and emerge edgewise, while at the same time it is turning the opposite float so that it shall enter the water flatwise, substantially as described.

45,836.—Securing the Necks to Door Knobs.—Thomas Kennedy, of Branford, Conn.:

I claim securing the neck to knobs substantially as and for the purpose herein set forth.

45,837.—Treadles for Operating Machinery.—John J Kimball, of Naperville, Ill.:

I claim the treadle, D, hung centrally on a shaft, a, provided with two pitmen, C C, which are connected to reverse cranks, B B, on the shaft, A, in combination with the foot piece, E E, hung on shafts, b b, which are fitted in the treadle, and all arranged to operate, substantially as and for the purpose specified.

[This invention consists in constructing a treadle in such a manner that the weight of the operator will be made subservient in actuating it, muscular force not being expended or required in any great degree.]

45,838.—Swinging Gear for Threshing Machines.—James Kline and Vroman Becker, of Chicago, Ill.:

We claim the combination of a stationary hanger with two sleeves and a socket, and a movable hanger or stirrup, with a perforated plate attached, and the hook, all combined and operating substantially as described.

45,839.—Fly Traps.—David Lake, of Smith's Landing, N. J.:

First, I claim the angular wheel, A a', operating in connection with the cap, D, and passage, E, to conduct the flies, in an undisturbed manner, to a point from which it will be impossible for them to regain their freedom, substantially as set forth.

Second, In combination with the aforesaid angular wheel, I claim the circular trough, G, adapted by its form to be readily inserted and removed, in the manner and for the purpose described.

Third, In combination with the said angular wheel, I claim the pivoted gate, H, weighted as and for the purpose described, and employed to cause the flies to leave the wheel, A, and enter the receiver, F, in the manner explained.

45,840.—Dress Facing.—James A. Mackee, of Boston, Mass.:

I claim the new manufacture or combination dress facing, as composed of the water proof or enameled cloth band, and the flexible linen band, or its equivalent, arranged and connected together in manner and to be used substantially as specified.

45,841.—Machine for Cutting Sheet Metal.—Hosea Low, of Waukon, Iowa:

I claim, first, The employment or use in machines for cutting sheet metal of two sets of cutters, F F', arranged in one and the same oscillating frame, E, or in two frames, the open ends of which point in the same direction, substantially as and for the purpose set forth.

Second, The combination of the cutter frame, E, with the slotted shaft, a, substantially as described, so that said frame can be lengthened and shortened from the center.

Third, The combination of the central shaft, a, with the adjustable U-shaped standard, D, and cutter frame, E, and clamps, H, substantially as set forth, so that the center around which the cutters turn can be brought in any desired position in relation to the clamps.

Fourth, The radial sliding arms, K K, applied in combination with the carriages, I I, movable center, a, and cutter frame, E, in the manner and for the purpose, substantially as set forth.

Fifth, The employment or use of a slide, M, carrying a pair of circular cutters, l and moving in rectilinear guides substantially as described, for the purpose of cutting off bevels, as for squaring plates of sheet metal.

Sixth, The gauges, L, applied in combination with the clamps, H, substantially as described, and acting in the double capacity of gages and of eccentric cams for compressing the clamps.

Seventh, The employment of the adjustable plate-holder, N, in combination with the cutters, F F', and cutter frame, E, constructed and operating substantially as and for the purpose set forth.

☞ This invention relates to a machine for cutting sheet metal, in which two sets of cutters are arranged in one frame, or in two rames, the open ends of which point in the same direction, and

which turn on the same center, in such a manner that by the action of these cutters two consecutive circles are cut in one operation.]

45,842.—Automatic Folding Gates.—John B. Mahana, of Benson, Vt.:

I claim, first, The combination of the folding or rising and falling gate, with the trippers, D, for opening and closing the gate by the action of the wagon or other wheel in passing the gate, substantially in the manner and for the purposes set forth.

Second, I also claim the peculiar arrangement of eccentrics, I, wires, L, cords, G G', and pulley, H, for opening and closing the gate, substantially as described.

45,843.—Ladies' Breast Pads.—John A. Mason, of Brooklyn, N. Y.:

I claim the breast pads, constructed with the parts, A B and C, substantially as above described.

[This invention consists in an improvement in breast pads, whereby economy and simplicity of construction, and elegance of shape are attained in a high degree, and this article of a lady's attire is made less liable to the objection that it is injurious to health by reason of the thickness and solid character heretofore given to it.]

45,844.—Presses.—James A. McGillivrae, of Dyer, Ind.:

I claim, first, The employment or use of a cast-metal beater, I, provided with holes, b, to admit of the escape of air from the press box, substantially as set forth.

Second, The trip wheel, N, constructed and arranged substantially as shown, for operating the beater, I, in combination with toothed wheels, O and P, as described.

Third, The two levers, E E, in combination with the inclined plains, H H, for operating the follower, F, substantially as set forth.

[This invention relates to a new and improved press for baling purposes, and of that class which are provided with a beater for compacting in the press box the material to be pressed previous to the pressing operation.]

45,845.—Rotary Boilers for the Manufacture of Paper Pulp.—Harrison B. Meech, of Fort Edward, N. Y.:

I claim, first, The combination of the pipes, b' c c' and d', with their respective stop cocks, F N and G, with the pipe, a C, entering into the rotary, Y Y, in the manner and for the purposes above described.

Second, I claim the perforated cap, B, in combination with the steam pipe, A a a, passing out of the rotary through its journals, a', in the manner, and for the purpose above described.

Third, I claim the combination of the pipe, A a a, the steam chamber, K, the pipe, g', and the stop cock, M, in the manner and for the purpose above described.

45,846.—Manufacture of Prussian Blue.—John M. Merrymon, Indianapolis, Ind.

I claim the use of a solution of Bichromate of Potash and a solution of acetate of lead in the manner and for the purposes herein described.

45,847.—Sawing Machines.—Henry J. Miller, Shanesville, Ohio.

I claim the combination of the shaft, J, pinions, h i, suspending racks, H I, hangers, b E, slideways, b c, guides, d e, cross heads, l m, and horizontal saw, A, all arranged to operate as herein specified.

[This invention consists in the application of two pairs of slides suspended from vertically adjustable posts in combination with a saw secured to cross heads to which a reciprocating motion is imparted by head steam or any other suitable power in such a manner that a log placed under the saw is exposed to the full weight of said saw augmented by that of slides, cross heads and forks, and by these means the operation of sawing is effected in an expeditious and easy manner.]

45,848.—Fruit Box.—Edmund Morris, Burlington, N. J.:

I claim the above described method of constructing fruit boxes without the use of nails or glue, whether made of wood or other material, and of whatever shape.

45,849.—Ejectors for Oil Wells.—George M. Mowbray, Titusville, Pa.

First, I claim the frame constructed substantially as described with one or more stuffing boxes to receive the tube connecting with the blast pipes, substantially as described and for the purposes set forth.

Second, I claim the collar, a, forged upon or otherwise secured to the tube, A, in combination with the hollow sleeve screw, B, for the adjustment of the tube, A, substantially as described and for the purposes herein specified.

Third, I claim the hollow screw, B, and templet female screw plate, C, in combination with the tube, A, substantially as and for the purposes described.

Fourth, I claim the hollow cap, G, in combination with the blast tube, A, substantially as described and for the purposes explained.

Fifth, I claim the combination of a T, fitted with a cap, G, stuffing box, D, and lugs to receive bolts, c c, with templet and hollow screw substantially as described and for the purposes set forth.

45,850.—Machine for forging File Blanks.—Wm. S. Nicholson, Providence, R. I.:

First, I claim swaging and shaping a file blank or similar article by the method and on the principle substantially as described.

Second, The method substantially as described of regulating and varying the rate of speed at which the devices for swaging the metal shall travel, by means of an irregular surface, K, moving with the swages in combination with the mechanism by which such swages are moved as herein specified.

45,851.—Elevators.—A. B. Nimbs, Buffalo, N. Y.:

I claim a wrought iron elevator leg constructed of wrought iron angle bars, C, and connected and strengthened by wrought iron diagonal braces, D, or by sheet iron plates, L, the two trunks of the leg being connected at the top by the semicircular arches, c' c3, and at the bottom by the cast iron foot box, A, substantially as described.

45,852.—Wire Fence.—Joseph W. Norcross, Middletown, Conn.:

I claim, first, the use in the construction of a wire fence of one continuous piece of wire for each section substantially as and for the purposes set forth.

Second, The pulleys, a b c d, attached to rigid posts, c c', and to movable posts, D D', and operating in combination with the wire, W, and with right and left handed screws or their equivalents substantially as and for the purpose described.

Third, The brackets, g', with oblique slots, h, applied to movable or rigid posts, E, and operating in combination with the wire, W, substantially as and for the purpose set forth.

Fourth, Casting the bearings of the pullies, a b c d, solid with the posts, C C' D D', substantially as and for the purpose described.

45,853.—Preparing Hay for Baling.—G. H. Nye, Monmouth, Ill.:

First, I claim the rollers, B C, when provided with flanges, c c, substantially as and for the purpose herein specified.

Second, The combination of flanged crushing rollers, B C, with the knives, g g, substantially as and for the purpose set forth.

45,854.—Manufacturing Screw Drivers.—George Parr, Buffalo, N. Y.:

I claim manufacturing screw driver blanks or blades and other similar tools, by the process substantially as herein described.

45,855.—Method of Preventing Oil-barrels, &c., from Leaking.—George T. Parry and William S. Warner, Philadelphia, Pa.:

We claim the employment of paraffine to prevent leakage from barrels and other vessels of wood.

45,856.—Water Gages for Steam Generators.—Townsend Poore, Scranton, Pa.:

I claim, first, The arrangement, consisting of the cock, F, plug, G c, flanged tail stock, C, segment pipe, D, and index hand, g; the whole being combined and fitted to the boiler substantially as and for the purposes herein described.

Second, So fitting the several parts of the apparatus together and to the boiler that the one plug, G c, answers the two fold purpose of opening or closing the cock, F, and of twining the segment pipe, C D, to any position desired in the manner herein described.

Third, The application of a hollow perforated vessel, H, to the hollow drain pipe of a try-cock substantially as described.

Fourth, The application of a cup, K, to the inner end of the discharge pipe, D, for determining the hight of water in the boiler when there is no pressure therein, substantially as described.

45,857.—Composition for Lining Barrels, &c., containing Petroleum.—Henry Preuss, New York City:

I claim a composition produced by combining litharge with glue or its equivalent with or without other materials, for lining barrels or other packages of oil.

45,858.—Fence Gates.—Fitch Raymond and August Miller, Cleveland, Ohio:

We claim the arrangement of the ring or hoop, D, with the groove, f, and gate, A, in combination with the rollers, e e, cord, d, and weight, when operating conjointly as and for the purpose set forth.

45,859.—Beehives.—Oliver P. Reeve, Tipton, Iowa:

I claim the arrangement of the comb frame and comb guides constructed as described in combination with the groove, i, in the side of the hive and the double inclined bottom, substantially as and for the purposes specified.

45,860.—Cultivators.—Cyrus Roberts, Three Rivers, Mich.:

I claim, first, The combination of the main frame, the shifting plow frame, the lifting lever, and the shifting machine arm, O P, with the driver's seat, when arranged for joint operation as described.

Second, The shifting foot lever, R, constructed and arranged to operate as and for the purposes described.

Third, The combination of the shifting frame, the plows, and the corn guard with the main frame when constructed and arranged in operating as described for the purposes set forth.

45,861.—Cultivators.—Cyrus Roberts, Three Rivers, Mich.:

I claim, first, The combination of the double ended shoves with their stocks, by means of the reversible swiveling brackets, e, and bolts, c, in the manner described, for the purpose of reversing the shovels when worn or injured, and of turning them sidewise to throw the earth more or less towards or from the plants as desired.

Second, The combination of the shovel stocks and shifting frame by means of the brackets, J, bolts, j3, and clips, j4, as described for purpose set forth.

Third, The combination of the shovels, the auxiliary or shifting frame, and the main frame when constructed and arranged as described for the purposes set forth.

Fourth, The combination of the plow stocks and shifting frame by means of the brackets, J, slots, j', and set screw, j, as and for the purposes described.

45,862.—Feeding Corn to Corn Shellers.—H. C. Robinson, Monmouth, Ill.:

I claim the employment or use of an endless apron or carrier in connection with a crib or corn receptacle, provided with removable slats or boards, d, at its bottom, substantially as and for the purpose herein set forth.

I also claim a crib or corn receptacle divided into a series of compartments and provided with a well hole, arranged as shown, when used in connection with the endless apron or carrier and the removable slats substantially as described.

I further claim the arrangement of the endless apron or carrier, E, with the bottom, b, of the box, F, and the spout, G, for the purpose of carrying off the loose or shelled corn as set forth.

[This invention relates to a new and useful device for feeding corn to corn shellers from cribs so as to avoid all handling or carrying of the corn from the place where it is stored to the sheller. The invention is more especially designed for shelling corn in large quantities for shipment from warehouses.]

45,863.—Baling Press.—Chas. H. Robinson, Bath, Me.:

I claim the combination of the levers, C, bars, D, ropes, F, and shaft, E, all arranged and applied to the follower, B, to operate in the manner substantially as and for the purpose herein set forth.

[This invention relates to a new and improved baling press of that class in which levers and a windlass are employed for elevating the follower.]

45,864.—Shifting Gear.—Charles D. Rogers, Utica, N. Y.

I claim the lever, I, with cam, J, attached, provided with two notches, f f', in combination with slide, E, connected with the pinion, C, and provided with the pin, K, and the sleeve, H, provided with the pin, K', and arranged with the spiral spring, G, all arranged to operate in the manner substantially as and for the purpose specified.

I claim the lever, I, and cam, J, in combination with the slide, E, provided with two pins, K K', either or both being fixed or movable, when said pins are arranged so as to engage with or lock into the notches, f f', as set forth.

I also claim the flange, L, provided with the slot, i, when arranged in relation with the box, M, substantially as and for the purpose specified.

[This invention relates to a means whereby the pinion which gears into the large spur wheel of reaping and mowing machines, may be moved or adjusted so as to render the long or crank shaft, and consequently the sickle, operative or unoperative as desired.]

45,865.—Loading and Unloading Hay Wagons, &c.—Seymour Rogers, Pittsburgh, Pa.:

I claim the turning upright, B, placed at the rear part of the wagon and composed of two parts, a b, connected by a joint in combination with the windlass, E, arm, D, and rope or chain, F, all arranged to operate substantially as and for the purpose herein set forth.

I further claim the same device for binding the hay on the wagon in combination with windlass, H.

[This invention relates to a new and improved loading and unloading attachment for wagons and has for its object facility in performing the work above specified as well as the securing of the load on the wagon.

45,866.—Cultivators.—E. H. Sawyers, Orleans, Iowa:

First, in combination with the lever, L', and shaft, L, I claim the oblong slot, i, formed and employed in the manner and for the purpose specified.

Second, I claim the described arrangement of the adjustable cultivator frame, I J F E B, the brace rods, h, angular shaft, M, and draught rod, N, the whole being employed in the manner and for the purposes set forth.

45,867.—Device for Producing Motive Power by the Vertical rise and fall of the Tide.—Augustus W. Scharit, St. Louis, Mo.:

First, I claim the combination of a float, screw shaft and the valve or valves for filling and emptying the same substantially as shown and described.

Second, I claim the combination of a float with the double rack for communicating the power substantially as shown and described.

Third, I claim the combination of a float with the single movable rack for communicating power substantially as shown and described.

Fourth, I claim the double-sided valves substantially as shown and described.

Fifth, I claim the combination of the screw cog wheels, ratchets and pawls substantially as shown and described.

Sixth, I claim the combination of the single rack and double ratchets and pawls substantially as shown and described.

Seventh, I claim the arrangement of the double or twin pairs of ratchets and pawls substantially as shown and described.

Eighth, I claim the combination of the double rack and wheels with the lever and screw and slotted rod and screw attached to frame guide substantially as shown and described.

Ninth, I claim the endless chain pulley, drum or windlass, in combination with the endless band or chain rods, hooks, pulleys, beam and hinged drop substantially as shown and described for loading and unloading vessels and for other purposes.

45,868.—Billiard Indicator.—R. Schmitz, Brooklyn, N. Y.:

I claim, first, The notched shaft, E, in combination with the slide, C, cam rods, i i, index, e, and scale, a, constructed and operating substantially as and for the purpose set forth.

Second, the cam rods, i i', in combination with the notched shaft, E, slide, C, and spring catch, f, constructed and operating in the manner and for the purpose substantially as described.

Third, the swinging bar, m, and cam, l, in combination with the slide, C, and registering device, v u, constructed and operating substantially as and for the purpose specified.

[The object of this invention is to protect the interest of the proprietor of a billiard saloon by compelling the players to play each game right straight through, and preventing them from pushing the index back for the sake of prolonging a game.]

45,869.—Drills for Boring Mills.—John Sheffield, Putneyville, N. Y.:

I claim a drill for artesian wells composed of the chisel bars, C D, and bent or oblique arm, B, of the drill rod, A, connected together by pivots, and arranged substantially as and for the purpose herein set forth.

[This invention has for its object the constructing of a drill in such a manner that it will be capable of expanding and enlarging the bore or shaft of an artesian well at its bottom. The invention more especially designed for enlarging the bottoms of oil wells so as to open more veins than the ordinary bore or shaft will intersect and cause the well to be more productive than it otherwise would be.]

45,870.—Rail Road Axle Boxes.—S. T. Shelley, Louisville, Ky.:

I claim, first, hinging the covers of axle boxes by means of a cam-joint hinge constructed substantially as described working on a reciprocating spring bolt or its equivalent.

Second, I also claim making an enlargement, e, in the hinge, A, for receiving the bolt head and spring, f, in combination with the reciprocating bolt, C, and the hinge, A, for the purpose of protecting the spring and bolt from dirt and other obstructions substantially as described.

45,871.—Rail Road Cars.—Sidney Skillman, Jersey City, N. J.:

First, In combination with the placing of the boiler and engine of a locomotive car on a truck in such manner that the boiler is received within a compartment at one end of the car, I claim the construction of the car with such an opening in the bottom or floor and a door or other suitable opening in one end as to permit the boiler to pass out with the truck when the latter is run out from under the car substantially as herein described.

Second, The stationary platforms arranged within the car body and in relation to the boiler and truck, D, substantially as herein described to serve as standing places for the engineer and as a protection against injury in case of getting off the track.

Third, In a locomotive car having the engine and boiler detachable, I claim attaching the smoke pipe permanently to the car substantially as and for the purpose herein described.

45,872.—Device for Shrinking Tire.—C. V. Statler, Wataga, Ill.:

I claim the two bars, B C, one, B, fitted in the bed, A, by a pivot bolt, c, and the other, C, arranged so as to slide therein, and the two bars connected at their lower ends by one or more bars, D, and provided above the bed with the dies, f f, in combination with the clamps, F F, pivoted to the bars, B C, the spring, E, and lever, J, provided with the cam, K, all arranged to operate in the manner substantially as and for the purpose set forth.

[This invention relates to a new and improved implement or device for upsetting or contracting tires for wheels so that the frame may, in case of the wheels shrinking, be reduced in diameter so as to be adjusted snugly on the latter without the trouble of cutting and rewelding a comparatively tedious and expensive process.]

45,873.—Weighing Bucket.—David D. Stelle, New Brunswick, N. Y. Ante-dated Nov. 14, 1862:

I claim, first, The weighing attachment, b c, or its equivalent in combination with the bucket, A, and its ball, B, constructed and operating substantially in the manner and for the purpose described.

Second, The arrangement of springs, i, and spring stop, g, in combination with the hinged bottom, D, of the bucket, A, as and for the purposes specified.

Third, I claim the arrangement of the rings, R and Q, grinding the string, P, as described within.

45,874.—Sleds.—Judd Stevens, of Marengo, N. Y.:

I claim in connecting the bolster, C, with the way, a, by means of the rounded bearing, c, fitting in the depression, b, for the purpose of allowing a free turning or oscillating movement of the bob, and employing the friction rollers, d f, to obviate the friction in the end movement of the bob, in adapting itself to an irregular surface, the whole arranged combined and operating substantially as herein set forth.

45,875.—Water Wheels.—Robert Stewart, of Fultonham, N. Y.:

I claim the buckets, d, having the vertical, transverse oblique and inclined surfaces, e f f, and attached to the case, b, with the bands h h, encompassing the inclined surfaces, f f, in connection with the series of spades, a, all arranged substantially as set forth.

45,876.—Artificial Arms.—Ignatius Stoffel, of Washington, D. C.:

First, I claim the peculiar construction of my artificial hand and wrist joint, the lumbar region of which is represented by a hollow metallic case, with an elastic palm; the phalanges, t t t' t' t'', and t'' t'' t'', operated by the springs, p p p p, representing the four tendons of the flexor profundus, and articulated by the guide rings, u u u u, representing the tendinous bands at the corresponding places of the natural hand; also, the hinged thumb and the thumb lever, q, representing the flexor brevis pollicis, in combination with the stirrup, l, and the spring, m, by which arrangement the elasticity of the cartilages of the natural hand is secured, as described within.

Second, I claim the peculiar construction of rod, l, and ratchet bar, K, in combination with the fork lever, a, fastened to the elbow, and the construction and arrangement of the trigger, d, with catch, c, and trigger spring, f, as specified and for the purpose set forth.

45,877.—Digging Machine.—Charles H. Stratton, of Munroetown, Pa.:

I claim the employment or use in a steam digging machine of a series of spades, arranged in such a manner as to penetrate the earth, rise or swing upward with their load, and then turn one-quarter of a revolution to discharge the same, substantially as herein shown and described.

I further claim the slots, g, in the shafts, F F, having spiral outer ends, h, in connection with pins, i', fitted in the bearings, e, and passing into the slots, g, the shaft, G, in which the bearings, e, are attached, and the crank shaft, B, all being arranged to operate the spades, E E', as set forth.

[This invention relates to a new and improved machine for spading the earth, with steam as a motor, and it consists in the employment or use of spades or forks of any suitable or desired number, arranged in such a manner that they will, as the machine is drawn along, penetrate the earth and lift and turn over the same, similar to hand digging, and perform the work equally as well.]

45,878.—Ovens for Converting Iron into Steel.—William A. Sweet, of Syracuse, N. Y.:

I claim, first, The combination and arrangement of the heating furnaces with the converting chamber, A, substantially as described.

Second, The dead holes, H, in combination with the heating furnaces and chamber, A.

Third, The boshes or angular projections, m m, as related to the bottom of the chamber, A, and the dead holes, H.

Fourth, Gradually diminishing the fire spaces, S S, from the boshes, m m, to the openings, o o o, at the top of the chamber, A.

Fifth, The openings, o o o o o p p p p, substantially as described and for the purposes set forth.

Sixth, Supporting the upper edges of the chamber wall from external pressure, substantially as described and for the purposes set forth

45,879.—Manufacturing Cutter Bars for Harvesting Machines.—George B. Taylor, of Worcester, Mass.:

I claim forming the holes for the rivets or bolts, by which the cutters are fastened to the cutter bars in reaping and mowing machines by punching, in combination with holding the cutter bar during the operation, so that it can not elongate in the direction of the heel of the bar, for the purposes herein set forth.

I also claim the use of the combined pattern and supporting bar, B, as shown and described, to aid in the operation of punching cutter bars, substantially in the manner herein described.

I also claim, in combination with the pattern or supporting bar, B, the bolt, d, and stay clamps, C, for holding the cutter bar, substantially as herein set forth.

45,880.—Harness Saddle Trees.—Samuel E. Tompkins, of Newark, N. J.:

I claim the two bearings, A A, connected together by a thin strip or plate, B, made of convex form at their under sides, to correspond to the shape of the back of the animal, and having a corresponding concave surface at their upper sides, when said bearings thus formed and connected together are provided with nuts, a, at their upper surfaces, to receive the turret screws, b, and all used in connection with the metal jockeys, E E, flaps, C, and back board, F, substantially as herein set forth.

45,881.—Stove Grate.—George Vander Heyden, of Troy, N. Y.:

First, I claim the bed plate, B, when constructed respectively at each end of said plate, with the direct bearings, a a, and reverse bearings, b b, in the manner substantially as herein shown, for the purpose of supporting and operating stove grates, in the manner herein set forth.

Second, In combination with the bed plate, B, I claim the fire grate, C, when constructed substantially in the manner as herein described and shown, so that the said grate can be operated in combination with said bed plate, fully in the manner and for the purposes as herein specified.

45,882.—Side-hill Plows.—Nathan Vars, of Newmarket, N. J.:

I claim the employment or use in a side-hill plow, of a subsoil share, G, having its standard, F, attached to an adjustable or swinging arm, G², arranged substantially as shown, to admit of the subsoil share being adjusted to either side of the plow beam, to suit the position of the mold board, C, and share, D, as set forth.

[This invention relates to a combination of a subsoil and a side-hill plow, and it consists in having the subsoil attached to an adjustable standard at the rear of the plow beam, and arranged in such a manner that the subsoil share may be adjusted either to the right or left side of the plow beam, according to which side the mold board and share of the sod plow is adjusted, thereby admitting of a combination of the two plows, and in such a manner as to insure a perfect working of both.]

45,883.—Stove Grate.—Geo. W. Walker, Boston, Mass.:

I claim a stove grate having capabilities both of horizontal reciprocation, and of vertical swinging movement, when the grate is hung at its rear side to allow these movements, substantially as set forth.

And in a grate so constructed, I claim giving to each end bar of the grate such width and disposition that in its sliding movement under the stove lining, the capability of free movement of the grate is maintained, substantially as described.

45,884.—Pen-holder.—Sylvenus Walker, Boston, Mass. Ante-dated Sept. 11, 1863 :

I claim the hollow silvered glass pen-holder, sealed up and protected as and for the purposes set forth, as a new and highly ornamental manufacture.

45,885.—Grain Binder.—Saml. Jacob Wallace, Carthage Ill.:

I claim, first, The arm, Z, of wheel, O, sliding over slot of wire holder, Y, substantially as and for the purpose specified.

Second, The binder, G, in combination with a movable arm, F, or other equivalent movable part, so that the binder may be made traveling in relation to platform, A, substantially as and for the purpose specified.

Third, The combination of the rack, K, and twister, I, substantially as and for the purpose specified.

Fourth, The rack, K, arranged on frame, Q, substantially as and for the purpose set forth.

Fifth, The compresser shoe, V, arranged on frame Q, substantially as and for the purpose specified.

Sixth, The slotted wire holder, Y, bent or recurved, substantially as and for the purpose specified.

45,886.—Machine for Rolling Metals.—Hervey Waters, Northbridge, Mass.:

I claim the arrangement of a single yoke with its appurtenances and connections, substantially as and for the purposes specified.

45,887.—Adjustable Chair.—Theos. Weaver, Harrisburg, Pa. :

I claim, first, The construction of the arm frame, C C F F', and its combination with the haunch, U, or with the haunch, X, and its collar, K, and pin, when so constructed as to inclose the back, A, and seat, B, substantially as and for the purposes herein described.

Second, The combination and arrangement of the back, A, which is provided with the arm rests, D D, the tenons, S S, the ratchets, H, hooks and staples, O O', with the seat, B, which is provided with the arm rests, E E, the tenons bearing on R, the ratchets, J, when operated by the haunch, U or X, substantially in the manner as and for the purposes herein shown and described.

45,888.—Thill Attachment.—R. B. Willis, of Rochester, N. Y.:

I claim the combination and relative arrangement of the set screw, s, frictional plate, a, and the thill iron, B, with the bolt, b, and jaws, D, of the clip, the parts being constructed as and for the purposes shown and described.

45,889.—Mode of Operating Switches.—J. F. Wilson, Boston, Mass., and James C. Bartlett, Charlestown, Mass.:

We claim the employment of a shipping wedge connected with and operated at will from the car, and so as to enter between the switch and main rails of a track, substantially as set forth.

We also claim the arrangement of the shipping wedges for moving the rail in opposite directions, as shown and described.

45,890.—Derrick and Horse Power.—Dan. Woodbury, Rochester. N. Y.:

I claim, first, The employment of side braces, J, they being constructed, arranged and applied to mounted powers, substantially in the manner shown and described and for the purpose set forth.

Second, The peculiarly constructed stake iron, P, in combination with the double brace bars, J, for the purpose of holding the stake when driven more securely in position.

Third, Attaching the inner end of the sweep brace, I, to the bracket, R, or to the rim of the wheel, W, as and for the purpose shown and described.

Fourth, The combination and arrangement of the angle iron, D, with the joint plate, E, and the frame, A, of this class of horse-powers, as shown and described and for the purpose specified.

Fifth, Fitting the box, r, between the jaws or wings, n, of the joint plate, E, so as to have but a line of bearing vertically between the parts, as and for the purpose specified.

Sixth, The combination and arrangement of the rope spool or windlass, and the lack, G, constructed as shown and described, with the mounted powers, as and for the purposes herein set forth.

45,891.—Stake-holder for Railroad Cars.—A. R. Burdick (assignor to himself and J. D. Foster), Racine, Wis.:

I claim the box, A, provided with the flange, d, having a notch or recess, e, and two projections, f f, one or both in combination with the collar, C, provided with the flange, g, internal elliptical opening and the projection, h, all arranged substantially as and for the purpose herein set forth.

45,892.—Cultivating Land by Steam.—John Fowler, Jr., Cornhill, England, assignor to W. P. Tatham, Philadelphia, Pa.:

I claim the combination herein described, whereby the power of two engines, situated on distant headlands, is simultaneously employed in giving motion to an agricultural implement by an endless rope, in manner substantially as described, to haul the agricultural implement, alternately to and from each head land, as herein explained.

45,893.—Hand Stamp.—George J. Hill, Buffalo, N. Y., assignor to H. G. Leisenring, Philadelphia, Pa. :

I claim, first, The yoke, F, constructed and arranged in respect to the plates, E and G, substantially as specified.

Second, The bed, composed of the soft rubber ring, I, metal plate, J, and plate L, of harder rubber, leather or other equivalent material, the whole being confined in a recess in a base plate, B, and arranged beneath the stamp, as described, for the purpose specified.

45,894.—Calipers.—F. O. Washburn (assignor to himself and John C. Scott), Millville, Mass.:

I claim the index, C, and graduated plate, D, when arranged and applied to the calipers, substantially as and for the purpose specified.

[This invention consists in constructing the calipers in double form, or so as to have both ends capable of being used to gage or measure with, the prongs at one end being curved to measure the exterior of shafting, and the prongs at the opposite end being straight to measure the diameter of a hole or bearing to receive the shafting, both measurements being obtained at once or at the same time.]

45,895.—Revolving Grate.—P. J. Boris, Halifax, Nova Scotia :

I claim the revolving grate, D, arranged in the lower part of the flue or chimney, A, in combination with the eccentric, F, placed on the axis or shaft, C, of the plate, B, and arranged relatively with the dampers, E E, to operate automatically by the turning of the plate, B, and grate, D, substantially as described and represented.

45,896.—Automatic Hammer.—Wm. D. Grimshaw, Birmingham, England :

I claim, first, The system of employing a reservoir between the pump or pumps and the hammer cylinder for holding the compressed air, the reservoir to be formed in the framework of the machine.

Second, The combination of the adjustable but otherwise stationary valve, d' d', the slide valve, k, the cylinder, f, the piston, g, the piston rod, h, and the hammer, i, substantially as set forth.

Third, The combination of the valve rod, w, the friction wheel, y, the sliding friction wheel, b', and the shaft, d, substantially as and to the effect hereinabove set forth.

Fourth, The combination of the reservoir, b, the pump, o, and the stock-cock, t, as described.

Fifth, The arrangement described, of the pump, o, reservoir, b, friction wheels, b' and y, valve rod, w, valve, k, cylinder, f, and piston, g, by which they are made to operate in relation to each other, substantially as set forth.

45,897.—Gang Plow.—Thomas Short, Fairmont, Ill. :

I claim the arrangement of the double crank-shaped connecting rod, G, devices, e e, links, a' a', beam, E, lever, H, and post, I, the whole being employed for joint operation, in the manner and for the purpose specified.

45,898.—Rifling Breech-loading Fire-arms.—Hiram Berdan (assignor to Levi P. Morton, Trustee of Hiram Berdan, Abia A. Selover and Wm. B. Benson), New York City :

I claim the rifling or grooving of the counter bore of breech-loading fire-arms, substantially as and for the purposes herein shown and described.

45,899.—Breech-loading Fire-arm.—Hiram Berdan (assignor to Levi P. Morton, Trustee of Hiram Berdan, Abia A. Selover and Wm. B. Benson), New York City :

I claim, first, The protecting plate, E, swinging in a plane transverse to the barrel in combination with the ring, G, substantially as and for the purposes set forth.

Second, The protecting cover, I, and protecting plate, E, in combination with the latch, D, as herein specified.

45,900.—Suspended.

45,901.—Attaching Bayonets to Fire-arms.—Hiram Berdan (assignor to Levi P. Morton, Trustee of Hiram Berdan, Abia A. Selover and Wm. B. Benson), New York City :

I claim placing the bayonet blade and shank upon the underside of the barrel, in combination with the ramrod, substantially as and for the purpose herein shown and described.

RE-ISSUES.

1,848.—Artificial Gums and Palate.—John A. Cummings, Boston, Mass. Patented June 7, 1864 :

I claim the plate of hard rubber or vulcanite or its equivalent for holding artificial teeth or teeth and gums, substantially as described.

1,849.—Tanning Hides and Skins.—Simon H. Kennedy and Henry L. Elder, Philadelphia, Pa., assignees of Wm. Fields and Israel Townsend, Wilmington, Del. Patented June 7, 1864 :

We claim, first, The employment or use in tanning hides or skins, of a current of compressed air applied to the hides or skins in combination with the ordinary or other tanning liquors, in the manner and for the purpose substantially as specified.

Second, The perforated pipe, E, extending through the air-tight vat, A, near its bottom, in combination with an air pump and loaded valve, all constructed and operating in the manner and for the purpose substantially as herein shown and described.

1,850.—Lantern.—John H. Irwin and James F. Griffin, Chicago, Ill., assignees of John H. Irwin, aforesaid. Patented Nov. 4, 1862 :

First, I claim the cap or deflector, H, arranged below the top of the wick tube and operating substantially in the manner and for the purposes herein specified and set forth.

Second, I claim the combination of the jacket, G, and deflector, H, and forming the deflected air passage with the holes, e, all arranged and operating substantially as and for the purposes herein shown and described.

Third, I claim, in combination with the jacket, G, deflector, H, and holes, e, the prolonged oil cup, E, and vertical plates, d, arranged and operating substantially as and for the purposes described.

1,851.—Car Wheel.—Thomas Sharp, Chicago, Ill. Patented Sept. 29, 1863 :

First, I claim the construction of a car wheel, the combination of the two flanges, a d, with the broad tread described, when arranged and operating with respect to the different gages herein specified, substantially as delineated and set forth.

Second, I claim constructing said car wheel of a single casting, in the manner and for the purposes herein set forth and described.

EXTENSIONS.

Two and Three-ply Carpets.—Alexander Smith, West Farms, N. Y. Patented Dec. 10, 1850. Extended Dec. 10, 1864 :

I claim the weaving of two or three-ply ingrain carpets, the employment of parti-colored warp and weft, operated by the jacquard or other mechanical means to form the figure, when the same colors in the warp and in the weft are caused to combine together to form the same colored figure in the fabric, substantially as described.

Vat for Tanning Hides.—Lewis C. England, Williamsburgh, N. Y. Patented Dec. 24, 1850. Extended Dec. 17, 1864 :

I claim the slats, as described, in combination with the vat and the handler, substantially in the manner and for the purposes herein set forth.

Trigger-operating Revolving Fire-arm.—Stanhope W. Marston, New York City. Patented Jan. 7, 1851. Re-issued July 26, 1859. Again Re-issued Aug. 21, 1860. Extended Jan. 7, 1865 ;

I claim, first, So constructing the lock of revolving breech fire-arms which may be operated by trigger, as that the hammer, when raised to full cock, preparatory to firing, may be retained in that position of unstable equilibrium until the piece is fixed on a further pressure of the trigger, by means of a vibrating tooth or fly tumbler, independently of any dog, pawl, catch, or other mechanical device for that purpose.

Second, So constructing and arranging the lock of revolving breech fire-arms susceptible of operation by trigger, as that when the hammer is raised to cock, preparatory to firing, the trigger shall be held back or retained in a drawn position, by means of a vibrating tooth or fly tumbler.

Third, The use, in revolving breech fire-arms of a vibrating tooth or fly tumbler interposed between the hammer and trigger, and operating substantially as hereinbefore described, by an upward pressure on the hammer, so as gradually to increase the leverage and consequently the power applied to raise the hammer, and thereby reduce the effective resistance of the mainspring, for the purpose of securing steadiness of aim and greater ease in firing, and also allow the recovery of the trigger after firing, for repeated action.

The Patent Laws, enacted byCongress on the 2d of March, 1861 are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners, except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

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Having access to all the official records at Washington, pertaining to the sale and transfer of patents, MESSRS. MUNN & CO., are at all times ready to make examinations as to titles, ownership, or assignments of patents. Fees moderate.

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Many valuable patents are annually expiring which might readily be extended, and if extended, might prove the source of wealth to their fortunate possessors. Messrs. MUNN & CO. are persuaded that very many patents are suffered to expire without any effort at extension, owing to want of proper information on the part of the patentees, their relatives or assigns, as to the law and the mode of procedure in order to obtain a renewed grant. Some of the most valuable grants now existing are *extended patents*. Patentees, or, if deceased, their heirs, may apply for the extension of patents, but should give ninety days' notice of their intention.

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Parties sending models to this office on which they decide not to apply for Letters Patent and which they wish preserved, will please to order them returned as early as possible. We cannot engage to retain models more than one year after their receipt, owing to their vast accumulation, and our lack of storage room. Parties, therefore, who wish to preserve their models should order them returned within one year after sending them to us, to insure their obtaining them. In case an application has been made for a patent the model is in deposit at the Patent office, and cannot be withdrawn.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid) should be addressed to MUNN & CO. No. 37 Park Row, New York.

Notes and Queries

Horse-power.—It is a fixed rule of this, and all other well-regulated newspaper establishments, to disregard all anonymous letters.

J. W., of Conn.—You can sell an article before applying for Letters Patent without afterward invalidating your claim, but we do not think it a safe practice to adopt.

G. W. G., of Me.—On page 287 of our last volume you will find a description of an ice-making machine in practical use in England. The cooling is effected by the expansion of air previously compressed by a steam engine. It was considered a triumphant success to make one tun of ice by the expenditure of one tun of coal. The first stroke of an air pump, in exhausting a receiver, covers the interior surface of the receiver with a film of moisture. We do not find the data for filling your table.

R. H., of N. Y.—Baryto-celestine, a mineral which contains 35 per cent of sulphate of baryta, is found on Drummond Island, Lake Erie, and at Kingston, U. C. We are not aware that it is worked in this country. At Pittsburgh, Pa., large quantities of caustic soda are prepared, and sold under the name of concentrated lye.

D. T., of Mass.—You can not drill holes in glass with a common drill. They are usually made by a steel tool, like a punch in form, or flat on the end. The cutting is done by fine sand or emery. Wheeler & Wilson drill the glass in their cloth-pressers, with a tool like the one mentioned above, in connection with diamond dust. If you have many holes to drill it would pay to buy some diamond dust. Large holes in glass can be made by a copper tube and fine sand or ground glass. The ground glass can be procured at druggists.

T. G. R., of N. Y.—The best book for your purpose is the "Practical Draughtsman." Address H. C. Baird, No. 406 Walnut street, Philadelphia, and he will send it by return mail.

D. C. D., of U. S. N.—Stubbs's tools can be procured of any first-class hardware store in this city. We are not engaged in the commission business. You had better write to some friend in this city to procure what you desire. Subscriptions received.

A. W. S., of Mass.—The harmlessness of pure nitrous oxide has been pretty fully discussed in our columns.

E. L., of N. J.—Plaster casts are taken from the faces of living persons in the manner you suppose. Tubes to breathe through are inserted into the nostrils, and the moistened plaster is then spread over the face and head. The velvet on wall paper and toys is prepared by cutting waste velvet into dust; it is velvet shoddy.

A. S. R., of N. H.—The best way to stop the leak in your boiler is to put a plate over the crack. All other expedients are shiftless and only temporary.

J. R. M., of Tenn.—There is no work on the locomotive link or link motion. Discussions of it can be found in Bourne's Catechism and Camdin's Practical Engineering, Main and Brown's Marine Engine, etc. The link used on Rogers's patent is, we believe, one patented by Uhry and Lutgens, and if the radius is struck from three different points, as you say, it is for some reason best known to the patentees. We see no object in it.

Gas Blow-pipe, Buffalo, N. Y.—Your letter contained no signature, and we cannot, therefore, reply to your inquiry by mail. The invention seems to embrace novelty, and we think a patent can be secured for it.

D. H. S., of N. Y.—If you are distilling pine wood to obtain turpentine the acid which troubles you is doubtless acetic acid. Your proper remedy is to make your retort or still of cast-iron instead of wrought-iron.

M. V. B. P., of Canada East.—You can procure plumbago suitable for electroplating of Smith & Butler, No. 448 Broome street, New York. A good work on electro-metallurgy is Smee's, published by John Wiley, No. 535 Broadway, New York. The pressure of water at a great depth may force a cork into a bottle, and yet the water may not be sensibly compressed by the pressure.

T. E. F., of N. H.—The pressure at the bottom of a boiler is the same as at the top.

A Constant Reader, of N. Y.—It is a common practice with good cooks to bake the undercrust of mince, as well as of other pies, before the pie is filled.

J. A., of N. J.—The ports for your 6-inch cylinder should be four inches long by one-half inch wide.

C. E., of Pa.—When a horse is employed in moving a machine in a circular path the diameter of this path should not be less than thirty feet, but forty feet would be better.

O. B. M., of Mass.—The comparative economy of turbines and breast-wheels has been already fully discussed in our columns, but we should still welcome any new facts or ideas bearing upon the subject. There are some of the turbines you speak of at Woonsocket directly under Mr. Harris's eye, and he has doubtless considered their advantages. We would be pleased to illustrate Mr. Boyden's wheel.

Y. N., of N. Y.—The effects of adding large amounts to our specie circulation has been plainly shown since the discovery of the California mines. All except our share of the increased currency of the world goes abroad and is distributed among all nations. Our paper circulation does not go abroad, because foreigners will not take it. Some values adjust themselves more slowly to inflations of currency than others; among the slowest are wages, farms and Government bonds. It is the opinion of this writer that Government could have obtained the means to carry on the war with far greater ease if specie payments had been maintained.

J. H. M., of N. Y.—The preparation of India-rubber for vulcanizing is a complicated process of cutting, washing, grinding and kneading. It was fully described and illustrated in the first volume (New Series) of the SCIENTIFIC AMERICAN, pages 169 to 176.

H. S., of S. C.—You had better advertise your invention for removing scale from boiler tubes through our columns We do not undertake to negotiate the sale of inventions.

S. L. B., of Geo.—You can obtain drawing instruments at Messrs. B. Pike & Sons', No. 518 Broadway, New York.

R. E., of ——.—India-rubber can be dissolved in spirits of turpentine or naphtha, and it can be hardened to various degrees by sulphur and heat, with the addition of lime and other substances.

L. M. M., of Mass.—The action of drying substances on paint is mysterious. We cannot tell you how to prepare oil with black oxide of manganese in such way as not to have it become thick.

H. B., of Wis.—We do not think the artificial ears to which you refer amount to much.

Money Received

At the Scientific American Office, on account of Patent Office business, from Wednesday, January 4, to Wednesday, January 11, 1865:—

A. M. W., of N. Y., $12; J. W. P., of Mo., $30; W. H., of Del. $30; H. A. R., of N. Y., $35; S. & S. of Ohio, $20; G. S., of N. Y., $30; W. L., of N. Y., $45; J. H. P., of N Y., $72; H. A., of Ohio, $40; R. S. L., of Ill., $20; S. Van S., of N. J., $15; L. C. F., of Ill., $51; J. T., of N. Y., $45; P. C. P., of Ill., $70; W. A. H., of Ind., $45; H. W., of Wis., $30; J. H. D., of N. J., $15; B. McG., of N. Y., $20; F. & B., of N. Y., $15; G. F. J. C., of N. J., $30; H. H., of N. Y., $15; J. H., of N. Y., $30; J. A. L., of N. Y., $30; C. M. J., of N. Y., $34; J. E. S., of N. Y., $30; H. K. J., of Conn., $45; J. P. G., of N. Y. $40; P. & B., of Pa., $45; K. & L., of Mass., $20; J. S. L., of N. Y., $15; M. B. D., of N. Y., $40; A. R. J., of N. Y., $15; P. C., of Ill., $20; E. S., of N. Y., $30; F. J. E., of Ill., $20; H. B., of Iowa, $15; B. K., of Penn., $45; J. L. H., of Conn., $15; T. R., of N. Y., $41; P. W., of N. Y., $15; W. W. S., of U. S. N., $22; T. S. & W., of N. Y., $37; J. H. H., of N. J., $25; J. J. A., of N. Y., $30; L. B. H., of Mass., $48; W. G. A. B., of Del., $40; H. E. G., of N. Y., $20; J. T., of N. Y., $41; F. W. C., of N. Y., $15; W. T., of Ill., $30; C. D., of N. Y., $20; E. F., of N. Y., $15; T. D. E., of N. J., $22; R. K., of Ill., $20; N. De LaP., of Ohio, $16; J. W., of N. Y., $45; H. B., of N. J., $15; I. M. M., of Conn., $45; I. W. B., of N. Y., $20; J. F. R., of Pa., $20; C. E. B., of Mass., $16; J. W. F., of Cal., $20; O. W. K., of Wis., $25; J. M. R. of N. J., $15; H. L. B., of Pa., $15; M. B. W., of Ky., $16; C. S. S., of N. J., $15; P. G., of Pa., $25; A. J., of Pa., $16; A. L. B., of Minn., $25; L. R., of Ill., $16; P. J. C., of Conn., $50; G. L. M., of N. J., $25; B. & H. of Mass., $22; S. B. H., of Pa., $10. P. & K. of Pa. $275; J. H. O. N., of Pa., $25; E. E. S., of U. S. N., $30; C. P. C. of Conn., $15; E. B. T., of Mass., $20; R. H. & J., of Conn., $10; J. H., of Pa. $16; C. J. F., of Iowa, $15; H. R., of Ill., $15; D. T., of Ohio, $10; H. H. of Iowa, $16; D. G. F., of Wis., $25; J. H. C., of Mass., $25; J. H. G., of Ohio, $16; M. H., of Mich., $25; J. C. of R. I., $30; L. H. L. of N. Y., $16 F & L., of Me., $25; W. W. T., of N. Y., $16; G. L. D., of N. Y., $15; J. F. W., of N. H., $25; T. J. L., of R. I. $140; W. & H., of Ill., $16; G. W. B., of Conn., $15; J. A. R., of Pa., $25; G. W. S., of Pa., $20; H. K., of Iowa, $10; W. L. C., of Wis., $25. J. S., of N. Y., $25; F. B., of Iowa, $30; J. B., of Ill., $15; G. W. J., of Mass., $30; H. R. A., of Ill., $30.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, stating the amount and how it was sent, whether by mail or express.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office, from Wednesday, Jan. 4, to Wednesday, Jan. 11, 1865:—

T. S. & W., of N. Y.; (3 cases) J. H., of N. Y.; J. H. H., of N. J.; H. A. R., of N. Y.; W. H., of Del.; R. A., of Ill; J. J. Jr., of Ma.; (4 cases); J. M. C., of Mass.; J. L., of N. Y.; P. G., of Pa.; E. B T. of Mass.; E. E. S., of U S. N.; O. A., of Cal.; G. W. J., of Ms.; P. E. P., of France; W. H. H. of Ohio; J. W., of Wis.; J. W. P., of Mo.; C. D., of Canada; J. J. A., of N. Y.; J. T., of N. Y.; J. T., of N. J.; D. G. F., of Wis.; J. L. of Conn.; J. A. R., of Pa.; D. T., of Ohio; O. W. K., of Wis.; A. L. B., of Minn.; J. B., of Ill.; D. A. B. S., of France; F. & L., of Me.: R. & H. V. F., of Ind.; A. M. W., of N. Y.; J. A. L., of N. Y.; J. E. S., of N. Y.; C. M. J., of N. Y.; J. H. P., of N. Y.; T. B., of N. Y.; M. & H., of N. J.; L. R., of Ill.; G. W. S., of Pa.; H. R., of Ill.; J. F. W., of N. H.; J. H. O'N., of Pa.; W. L. C., of Wis.; M. H., of Mich.; F. M. L. D., of France; J. K., of Wis; T. J. L., of R.I. (2 cases).

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and enclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

MODELS are required to accompany applications for Patents under the new law, the same as formerly, except on design patents, when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgement of our reception of their funds.

Back Numbers and Volumes of the "Scientific American."

VOLUMES III., IV., VII., X., AND XI., (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $3 00 per volume, by mail, $3 75 which includes postage. Every mechanic, inventor or artisan in the United States should have a complete set of this publication for reference Subscribers should not fail to preserve their numbers for binding. VOLS. I., II., V., VI., VIII. and IX., are out of print and cannot be supplied.

THE CHEAPEST MODE OF INTRODUCING INVENTIONS.

INVENTORS AND CONSTRUCTORS OF NEW AND useful Contrivances or Machines, of whatever kind, can have their inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no second-hand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. It is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars address—

MUNN & CO.,
Publishers of the SCIENTIFIC AMERICAN.
No. 37 Park Row, New York City.

PROPOSALS FOR ICE.

MEDICAL PURVEYOR'S OFFICE, WASHINGTON, D. C.

Sealed Proposals will be received at this Office until January 25, 1865, for furnishing ICE to the Medical Department of the Army, at the points herein designated. The Ice to be stored by the contractor in properly-constructed ice houses at each point of delivery, on or before the 15th of April next; the ice not to be receipted for until its quality, the fitness of the ice-house, and the manner in which it is packed shall have been approved by a medical officer, and payment will be made only for the amount thus actually stored and receipted for.

The proposals will be made for the quantities indicated below as required at the respective places, with the proviso that should more be needed at any time for the year's supply, it shall be furnished at the same rates and under the same conditions.

QUANTITY TO BE DELIVERED AT

Annapolis, Md., icehouse, owned by the United States..... 150 tuns.
Point Lookout, Md., ice-house owned by the United States, 200 tuns.
Fortress Monroe, Va., ice-house owned by the United States 280 tuns.
Portsmouth, Va., ice-house not owned by the United States 100 tuns.
Newbern, N. C., ice-house not owned by the United States.. 400 tuns.
Hilton Head, S. C., ice-house owned by the United States... 450 tuns.
Beaufort, S. C., ice-house owned by the United States..... 300 tuns.
Savannah, Ga., ice-house not owned by the United States.. 400 tuns.
Pensacola, Fla., ice-house not owned by the United States.. 100 tuns.
Mobile Bay, Ala., ice-house not owned by the United States. 100 tuns.
New Orleans, La., ice-house owned by the United States.... 500 tuns.

Proposals will also be received for furnishing Ice, daily by weight, for the year 1865—in such quantities as may be required by the Surgeons in charge—at United States General Hospitals, at the places enumerated above, and upon the following annual estimate, in and near:—

Boston, Mass	10 tuns.
Portsmouth Grove, R. I	130 tuns.
New Haven, Conn	60 tuns.
New York	800 tuns.
Newark, N. J	100 tuns.
Philadelphia, Pa	1,300 tuns.
Baltimore, Md	500 tuns.
Frederick, Md	75 tuns.
Washington, D. C.,	2,500 tuns.

All additional amounts that may be required at these places until January 1, 1866, are to be furnished at the same rates.

FORM OF PROPOSAL.

The undersigned proposes to furnish —— tuns of first quality Ice, carefully packed in substantial ice-houses, at the within-named points, namely: ——, ——, ——, ——, at the following price per tun of two thousand pounds, namely: at —— —— —— —— tuns, at $—— per tun.

The Ice to be subject to the inspection, measurement and approval of a Medical Officer, or other properly-appointed inspector, before being receipted for.

Payment to be made from time to time upon duplicate bills certified to by the Medical Director.

(Signed) —— ——.
—— ——.

FORM OF PROPOSAL.

The undersigned proposes to furnish daily, or otherwise, all the Ice required for the hospitals, upon approved requisitions of Surgeons in charge, at or near the within-named points, at the following price per hundred pounds, namely: —— —— —— —— $—— cents per hundred pounds.

The Ice shall be of the best quality, and subject to the approval of the Surgeon in charge, who shall receipt for the actual amount delivered at each hospital.

Payment to be made from time to time upon duplicate bills, certified to by the Medical Director.

(Signed) —— ——.
—— ——.

The above form of proposals will be adhered to as closely as practicable. Other forms will be received by the Department and duly considered.

A proper guarantee that the bidder is able to fulfil the contract, certified to by the Clerk of the nearest District Court, or a United States District Attorney, must accompany the proposal, or it will be rejected.

An oath of allegiance to the United States Government must also accompany the proposal.

The contracts will be awarded to the lowest responsible party or parties, who will be duly notified by mail or otherwise that their bid is accepted, and immediately required to enter into contract under bonds to the amount of $5,000. The bonds must be properly certified, and the post-office address of principals and sureties stated upon them.

Bidders may be present in person when the proposals are opened. The post-office address of the parties proposing must be distinctly written upon the proposal.

Proposals must be addressed to "Surgeon Charles Sutherland, U. S. Army, Medical Purveyor, Washington, D. C."

The Department reserves the right to reject any and all bids deemed unsuitable.

CHARLES SUTHERLAND,
Surgeon U. S. A. and Medical Purveyor,
Washington, D. C.

Printed forms of proposal may be had at this office. 3 3

COMSTOCK'S ROTARY SPADER.—HAVING DISposed of the right to manufacture and vend Comstock's Rotary Spader throughout the United States, except the New England and other Atlantic and Pacific States, we are now prepared to issue licenses to manufacture and vend this implement upon the basis of a license fee of ten per cent of gross sales of machines made and sold to parties who will advance in cash the following sums, to be reimbursed from said per centage:—For the New England States, $5,000; for the State of New York, $6,000; for the State of New Jersey, $3,000; for the State of Maryland, $2,000; for the State of Delaware, $1,000; for the State of California, $10,000; for the State of Oregon, $3,000; or, for the whole to one party, $25,000.

We would call the attention of Manufacturers, Capitalists, and persons forming Joint Stock Companies, who may wish to secure a good thing cheap, to the following facts:—

The merits of the invention have been fully proven.

With it the preparation of the soil for seed is expedited, cheapened and improved.

It is capable of being constructed of any size, from one-horse power upward.

It is peculiarly well adapted to the application of steam power.

Sample machines can be had of J. C. BIDWELL Esq., Pittsburgh, Pa.

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FOR SALE.—1 by 10-FEET RUBBING BED, 5 cents per pound; 6 gangs of saws and 6 rip saws, 7 cents per pound; 2 cranes, 4 cents per pound; hangers and pulleys, 10 cents per pound; truck and track iron for sale cheap, all in good order. Foot 51st-st., N. R. Engines from 10 to 300-horse power, at DAVIS'S MACHINERY YARD, Nos. 17 and 19 Morris street, Jersey City. 3 4*

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N. B.—Reliable orders filled for any part of the world. 1tf

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IMPORTANT TO WOOLEN MANUFACTURERS AND YARN SPINNERS.—Greenwood's Patent Reciprocating Rotary Motion. An improvement in spinning wool and other similar fibers. Warranted to make yarn of a more even size, and requiring 20 per cent less twist. Is in operation in Camden Woolen Mills, New Jersey. State Rights for sale (all except Pennsylvania), or the whole patent will be disposed of. For further information address GREENWOOD BROTHERS, Camden Woolen Mills, N. J 3 2*

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A VALUABLE WORK FOR INVENTORS PATENTEES AND MANUFACTURERS.

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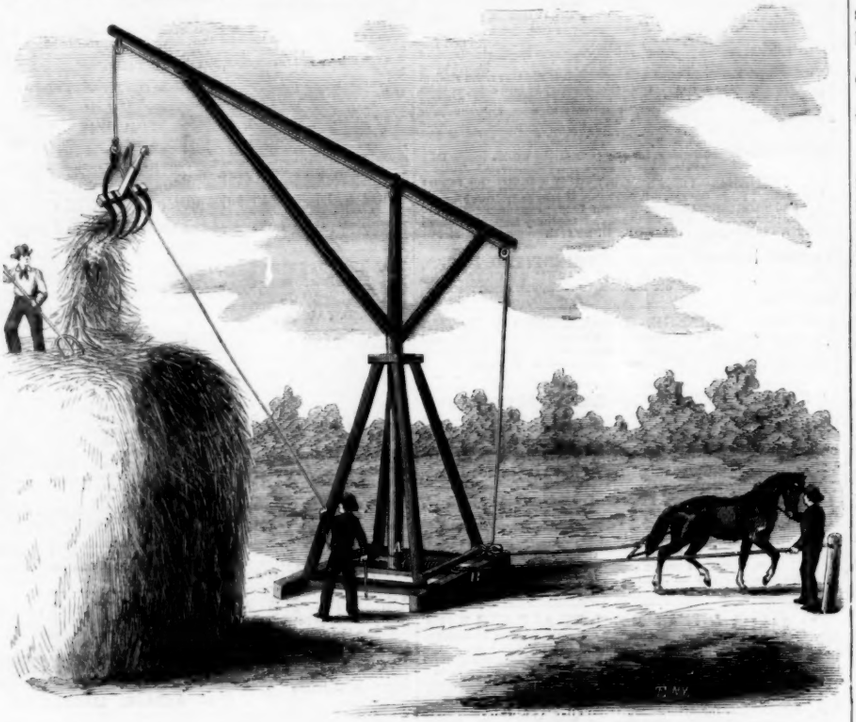
FOR WOODWORTH PATENT PLANING AND MATCHING MACHINES, Patent Siding and Resawing Machines address J. A. FAY & CO., Cincinnati, Ohio. 3 1y

Improved Hay-stacking Derrick.

This derrick is intended to facilitate stacking hay, and is so arranged as to raise the hay vertically, with ease deliver and discharge it without scattering the hay over the field. The hight of the derrick is about thirty feet, and the head can be swung around very easily and readily, so as to construct a stack of any desired hight. There is a small stop, A, at the bottom which fits in two holes diametrically opposite each



TURNER'S HAY-STACKING DERRICK.

other; by withdrawing the stop by the rope, B, of the derrick can be swung round and retained in place by throwing the stop in again. This gives complete control over the position of the derrick, and allows the hay to be delivered at any point with great facility. As the stack is built up the derrick can be shifted to various points in a short time. The ease with which this derrick can be worked is very great, and the inventor states that after many experiments he is satisfied that this one leaves nothing to be desired.

This invention was patented by Seth Turner, of Onarga, Iroquois Co., Ill., through the Scientific American Patent Agency, on Dec, 13, 1864. For further information address the inventor, as above.

A Hint on Carpets.

Of all the expensive things in a modern house of the ordinary class perhaps carpets are the dearest. In case of removal, they become almost useless, and have to be sacrificed at any price that can be got for them, because, having been cut and measured for one room, perhaps of a peculiar shape, they are useless in any other; for if the pattern could be matched, which it often cannot, a bit of bran new carpet sewn on a bit not so new, would be out of harmony, and tell a story which pride of poverty would rather were concealed. The Persian and Turkish system of carpeting rooms is infinitely better and prettier than ours. The Persian carpets, especially those from Resht, are exquisitely beautiful. Their colors are brighter, the designs are prettier, and they are far more durable than the European carpets. They are made in strips usually between two and three yards long, and about one yard in breadth, to go round the sides of a room, with a square carpet of any size preferred, for the center.

They do not require to be nailed or fitted, and a sufficient number of them, will, of course, carpet any room, however large or small. They have a very rich and grand appearance too. In summer they are easily taken up, beaten, rolled and put aside by a single man-servant; and in the hot weather why should we not more generally imitate Continental custom, by painting or polishing our floors? Floors painted or polished look far prettier in July sunshine than any carpets, which are then mere fusty traps to catch dust, harbor insects and retain bad smells. Everything has its use and its season. The use and season of carpets are not in the summer time. Where it is impossible to paint or polish the floors of a house, the employment of oil-cloth will be found good economy in summer, and far cleaner. Oil-cloth, too, of charming patterns, may now be bought very cheap, and it keeps a room delightfully cool and fresh.—*All the Year Round.*

BEECHER'S VENEER FRUIT BASKET.

The necessity for having some reliable contrivance to protect small fruits, while being transported to market, can readily be seen by referring to the many and varied baskets, pots and boxes, which from time to time are used for that purpose.

The old fashioned splint basket first used, (and still used in some sections,) is so constructed that it can not stand up without help, and is therefore continually spilling the fruit.

Then come the square boxes, a multiplicity of kinds, but all afflicted with at least one difficulty. They will not pack close enough together, when empty, to transport, except at ruinous cost to the shippers.

A great improvement on the above named kinds, in so far as they pack closely together, are the several pot-shaped styles of basket that have been used so extensively for the past few years. But these styles, escaping one evil, encounter another nearly as formidable. They are so small at the bottom as necessarily to be very deep to hold the requisite measure; the effect of which is that, when filled, the lower tier of berries are more or less damaged by the weight of those above them.

To obviate the difficulties here mentioned, and at the same time to combine all the excellencies of the different styles heretofore used, the Veneer Fruit Basket, which is represented by the above engraving, has been invented.

These baskets when empty nest closely together, and can therefore be shipped to any distance at a very light cost for freight. Again; the bottom being so large, allows the sides to be correspondingly low, thus furnishing what is an absolute necessity for the preservation and transportation of all ripe fruits—a shallow and well ventilated Basket.

They are furnished at the following prices: Quart size, $35,00 per thousand Baskets. Pint size, $30,00 per thousand Baskets.

This article was patented through Scientific American Patent agency, May, 31, 1864.

For further information address A. Beecher & Sons, Westville, Conn.

At Providence, last year, the transactions in printing cloths amounted to 2,697,150 pieces, a falling off from the previous year of 1,225,650 pieces. To show the extraordinary rise in prices, it is stated that printing cloths that sold for 4¾ cents per yard January 1, 1861, sold for 9 cents at the beginning of 1862, 14¾ cents 1863, 16¼ cents 1864, and 27 cents January 1, 1865.

[From the Steam Press of John A. Gray & Green